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A HOLIDAY STUDY

OF

CITIES AND PORTS

BY

ROBERT SWAIN PEABODY

NOTES OF TRAVEL OFFERED TO THE COMMISSION ON THE IMPROVEMENT OF
METROPOLITAN BOSTON BY ONE OF ITS MEMBERS

PUBLISHED BY THE

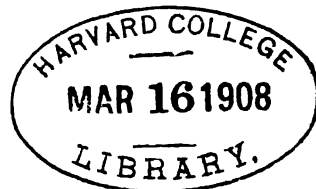
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A HOLIDAY STUDY
OF
CITIES AND PORTS

PEABODY



1908

OLD CORNER
BOOK STORE,
27-29 BROMFIELD ST.,
BOSTON.

From the Secretary
OF THE
Metropolitan Improvement League.

“A TOWN should be built so as to give its inhabitants peace and happiness.”—ARISTOTLE.

“THERE be three things which make a nation great and prosperous: a fertile soil, busy workshops, and easy conveyance for men and commodities from one place to another.”—BACON.

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I.

Introduction.

The vacation traveller in Europe has many things forced upon his attention to which he is not accustomed. He finds the "lifts" in his hotels antiquated. He sees the poorer classes in the costumes of their ancestors, or rattling through the streets in wooden "clumpers." Women work in the fields. There is no running hot water; and even in the countries of Pasteur and Virchow there is an absence of sanitary plumbing. He may conclude lightly that in other respects besides habits and costumes the march of improvement is slow. He may say that European cities have an insuperable barrier against modernization in the fact that they are old. It is true that in them the new and the old are closely intermingled. The smoke-enveloped towns of Westphalia are as ugly and modern as Sheffield or Pittsburg and yet are not far from antique towns like Halberstadt, Hildesheim, Goslar and Braunschweig, which, though they are traversed by trolleys and are kept clean in a truly modern way, preserve in their timbered gables and carved beams the same appearance that they have had for hundreds of years. But in spite of these contrasts, the cities of Northern Europe are in great part not old, but, on the contrary, very new indeed. During the last fifty years, in Europe as elsewhere, population has sought the cities, and these have outgrown the confines of the ancient walls. Then the change from sailing vessels to steamers for ocean transportation, the opening of the Suez Canal, and the increased prosperity of Germany since the Franco-Prussian War, have all united to alter the currents of commerce, and incidentally have made some small cities great, and created other cities where none before existed. As these cities gained in wealth, rich and prosperous modern quarters have encircled them in concentric rings; antiquity has given place to what is most new and most modern, so that it is no longer possible to think of these towns as old. In fact, though they may preserve their ancient monuments, and thus have a charm no wholly new city can possess, they are really in great part as new as our flourishing Western cities. When once the traveller's attention is given to the new quarters of these old European cities, to their streets and squares and monuments and public buildings, or to the ports from which many of them derive their riches, he cannot but agree that they show evidences of more design and forethought, and that the results are more effective, than is the case with similar work in America. Hence a study of how these towns obtained prosperity, and how they made use of their prosperity to better their municipal conditions, is interesting. A short and unexpected holiday abroad has given me an opportunity for such study. It has been hasty, and I recognize how little I am an expert on the subjects discussed, but I have made the following notes, certainly cursory and probably not perfectly exact in detail, as a citizen's modest contribution to the work of our Commission on the Metropolitan Improvement of Boston. Repeated studies like the recent report of the Boston Society of Architects, and like that which I now offer, may bring us gradually to a good result, just as by repeated tacks a ship makes her way to windward and to her desired port.

I had planned to take my holiday in Southern Europe, but, when the appointment of our Commission turned my thoughts toward municipal development, I found quickly that the most information on such subjects was to be gleaned, not so much in countries where things had been done, as in those where they are most actively in the doing. So I turned to the cities of the

North and quickly found an exciting interest in their push and energy, and in the scientific thoroughness with which they prepare easy paths for commerce, or expend the results of their industry in streets and squares and boulevards and public buildings. Such are the rivalries of trade, and so keen is the struggle for existence, if not for pre-eminence, that the seaports of Belgium, Holland, Germany and England, and, in a lesser way, of France, have been driven to vast outlays for the perfecting of their ports and of their transportation facilities. Holland built the North Sea Canal and the Rotterdam waterway and the vast docks to hold the commerce of her two ports, and she has been so abundantly rewarded that still greater docks are planned. The series of docks at Antwerp shows Belgian commercial life in great activity, and vast additions to these accommodations are in contemplation. The marvellous and sudden growth of the German ports and merchant fleets, the building by Germany of the Kiel Canal, the recent great extension of German inland waterways,—all are the expression of the vigorous life of that country. Indeed, a visit to the Hamburg docks is a sight never to be forgotten. London is a larger port, but its business is scattered and its apparatus seems to a casual observer old-fashioned; but at Hamburg the docks are so continuous, so systematic, so well ordered, so completely fitted with machinery and so filled with vessels from every clime, that it would be difficult to name any place that gives one a more vivid impression of the powers of humanity.

In these maritime cities commerce is naturally the foundation of prosperity; but hardly less interesting than the facilities afforded commerce is the way in which care and system and forethought have also been applied to the extension and beautifying of these same cities as they become prosperous. Certain general principles underlie both the development of these ports and the similar development of the increased city behind the port. Before making a review in detail of such cities as I visited, I will therefore first sketch these principles.

II.

Waterways, Canals and Canalized Rivers.

All Americans must be surprised when they discover to what an extent trade in Europe depends upon waterways. In the north of Europe a connection with the interior country by waterways of some sort is considered a prime requisite for a great port, and those cities have prospered most that have been on or at the mouth of great rivers. Indeed, where there were the other requisites for a port but only a small river, as at Emden, the Germans have made what is practically a river. The Ems-Dortmund Canal is such a waterway. It permits large canal barges to travel from the sea at Emden into the interior and to Dortmund, in the steel and coal country of Westphalia. There is also canal connection from Emden eastward to Bremen on the Weser River, and from Bremen one can reach the Elbe by canal, so that Emden, without any great natural river, is well supplied with artificial waterways. Lubeck, again, has no large waterway, but connects by canal with the Elbe. Dantzic is on the Vistula, which runs far up into Poland. Stettin is on the Oder, which penetrates Austria, and Dantzic and Stettin are connected by canals. Bremen has the Weser and, as has been said, connects with the Elbe to the east and with Emden to the west. The source of Hamburg's greatness lies largely in the fact of her position on the noble river Elbe, which traverses Germany and floats countless cargoes to and

from remote parts of Austria. The great river bears on its surface much more than half of the port's commerce, and owing to such facilities the port attracts much trade which one might expect to go to the foreign port of Antwerp, — better situated as she is in regard to the Atlantic and Western ports. (Plate 1.)

The Rhine, after connecting with the Danube by canal, traverses the whole west side of Germany only to find itself, as it divides into many branches, not in Germany but in Holland; and Rotterdam, which is its main *entrepôt*, and which is full of German commerce, is a Dutch port. Amsterdam, besides its outlets to the ocean, has canal communication with the Rhine. Antwerp is on the Scheldt, and canals connect it readily with the Meuse and the Rhine. Havre, Bordeaux and Marseilles also depend to a great degree on river commerce, and throughout Belgium, Germany and France there is a continuous network of waterways that are in the most active use and bring remote regions into cheap connection with business centres. We stayed at Dordrecht, a picturesque and antique town a few miles above Rotterdam. On one side of the hotel were the bright-colored streets and canals of a city that has remained practically undisturbed for centuries; but the hotel balcony on the other side overhung the Maas, which is the main effluent of the Rhine leading to Rotterdam. All day long the river scene was in constant change. Bright-colored barges with huge brown sails and long, waving pennants tacked briskly to and fro. Great steamers, coal-laden, or huge tows of one thousand ton barges, went speeding by; canal boats and puffing towboats added life and animation to the scene from morning until night.

Of course, all this prodigious traffic comes from wherever the Rhine and its tributaries penetrate. To indicate how entirely that river has changed its character and how thoroughly it has become a highway of commerce, let me describe what M. Jules Huret writes of one of the many ports that serve it.

Probably few people in Boston ever heard of Ruhrort, although for long it has been the centre for the coal traffic in the Ruhr Valley. In the seventeenth century the port had an area of $2\frac{1}{2}$ acres. In 1868 there were 71 acres of basins and 42 acres of warehouses. In 1890 there were 125 acres of basins and 125 acres of warehouses. Since then new basins have been built, costing \$7,500,000, over two miles long, 300 feet wide and 9 feet deep. The boats that serve this port are now 200 to 250 feet long, 30 feet wide and draw 6 feet of water and carry from 1,000 to 1,500 tons. The small Dutch boats, on account of the size of the Dutch canals, carry but 300 tons, but there are some boats 300 feet long and 36 feet wide, carrying 2,400 tons. This is not all. Other private ports are building near-by on the Rhine or the Ruhr to serve special steel works or furnaces of Krupp or Thyssen or Haniel. The traffic of Ruhrort nearly equals that of Hamburg. In fact, that of Ruhrort reached, in 1905, 9,000,000 tons and that of the adjoining Duisburg 7,000,000 tons, or, in all, 16,000,000 tons. If you add to this the little neighboring private ports and that of Hochfeld-Duisburg, you reach 20,000,000 tons. Hamburg has not yet arrived at that figure.

The English rivers and canals present no such animated views as can be had on the Rhine. During the last thirty years England has done practically nothing about inland navigation except building the Manchester Canal, which is rather a seaport canal than an inland waterway. Indeed, the present and the possible future condition of the waterways of England is a subject of much study at the present time, having been brought to the front by the inadequacy of the railroads to move freight. There is much information on them contained in the voluminous "Reports of the Royal Commission to Inquire into and to Report upon the Canals and Inland Navigation of the United Kingdom," published in 1906. Before the days of railroads the canals of England were the scene of great activity. They were the admiration and envy of foreigners, but were held to be useless by those who promoted the railways. The latter gradually obtained possession of them and they were permitted to fall into decay. Now that the railroads are

overburdened with traffic, people turn to the canals, but find them small, and their management greatly divided. Many now urge that they be increased in size, and that their management be combined, or that they be nationalized. It is a live question in England and one greatly discussed.

There are, of course, many books that treat of waterway commerce, and I am tempted to review what is said in some of these, and especially in Elzbacher's "Modern Germany," which is a most interesting and readable book.

"On a horizontal road, and at a speed of about three miles per hour, a horse can pull about two tons; on a horizontal railway he can pull about 15 tons, and on a canal he can pull from 60 to 100 tons. Therefore, from four to six times the energy is required in hauling goods by rail, and thirty to fifty times more force is expended in hauling it by road, whatever the motive force may be. Therefore, the cost of propulsion by water, whether the motive force be horse traction, steam or electricity, is only a fraction of the cost arising from propulsion by road or rail."

Also, more traffic can be sent over a broad canal than over a railway, and the roadbed for a railway is very costly — far more than most canals. Again, and for the same reasons that steamers of large size prove most profitable on the ocean, Germany has adopted large barges for inland commerce. The larger the ship or barge the cheaper the cost of transport, for no larger crew is needed and the dead weight of hull and the portions given to living rooms are in smaller proportions in the large vessel. To make navigation by these large vessels possible she has deepened and cleared her rivers and built harbors and quays at the towns. Cologne, which is 150 miles from the sea in a straight line, runs steamer lines to England, Scandinavia and Russia. Strasburg, 300 miles inland, now does a large traffic in vessels of 600 tons. \$5,000,000 has been spent in twenty years on the regulation of the river-bed of the Rhine, and \$2,000,000 on the Main, so that the same steamers that travel on the Rhine can now go to Frankfort. Towns like Crefeld and Carlsruhe, far from the Rhine, are now connected by canals with that stream. The great interest of the Rhine now lies not in its romantic views and ruined castles, but in the fact that it is the most perfect waterway in the world for the promotion of industry, and this hustling activity is not restricted to the Rhine. On all the rivers and canals of Germany commercial and industrial activity are marvellously developed. The Germans have spent very many millions of dollars on such work. A project much studied and discussed in Germany is the proposed "Midland Canal," which would connect the Dortmund-Ems canal with the Rhine on the one hand and the Weser and Elbe on the other. It would also continue from the Elbe by canals which connect with the Havel and the Spree, and through these rivers and their connecting canals would reach the Oder and the Vistula. Thus this great inland waterway would be continuous from the Rhine to the Vistula. The expense of such work would be very great, and yet these gigantic projects have been deliberately thought out. Evidently the belief in canals is genuine when a thrifty government will consider such expenditures notwithstanding that these canals will prove able competitors of the State railways; for, in fact, when a State builds a canal or canalizes a river it really subsidizes a public competitor of the railways. In countries where the railroads are not owned by the State one of their best services is to control in the public interest the prices that privately-owned railroads can charge.

"In consequence of the energetic steps which were taken for the purpose of improving the navigable channel of the Rhine, the volume of transport flowing over that river has, according to the official statistics published, increased in the following remarkable manner: —

THROUGH TRAFFIC OF GOODS PASSING EMMERICH (GERMAN-DUTCH FRONTIER).

		Up-stream.	Down-stream.
1889	. . . . .	2,799,800 tons	2,593,000 tons
1903	. . . . .	10,027,900 "	7,211,900 "

"An almost equally rapid increase in the traffic has taken place on all the other rivers and canals in Germany, and the quantity of goods transported by water has in consequence more than trebled during the last twenty-five years. Owing to the marvellous expansion of traffic which had to be handled, the tonnage of the fleet of ships used in German inland navigation has increased in the following manner:—

TONNAGE OF THE GERMAN INLAND FLEET.

	Number of Ships.	Tonnage.
1882	18,715	1,658,266 tons
1902	24,817	4,873,502 "

"From the foregoing figures it appears that between 1882 and 1902 the tonnage of the German inland fleet has been almost exactly trebled. We have often heard of the marvellous progress of the German merchant marine, but it would appear that the progress of the German inland fleet has been much more rapid, although it has not aroused such widespread attention. Whilst the German inland shipping has increased between 1882 and 1902 from 1,658,266 tons to 4,873,502 tons, the German merchant marine has between 1881 and 1902 only increased from 1,181,525 tons to 2,093,033 tons. The tonnage of German inland shipping, which twenty years ago was but fifty per cent larger than the tonnage of German sea shipping, is now, notwithstanding the marvellous growth of the German merchant marine, one hundred and fifty per cent larger than the tonnage of German sea shipping."

We neglect our waterways, and have come to think that large freight trains are the only economical instruments for moving freight. Still, in foreign books we are quoted as having a very large inland commerce. Of course, that means the lake commerce, which in our minds bears slight resemblance to that by canals; but not only does it closely resemble that on the modern Rhine and Elbe, but it does also depend on the "Soo" Canal, which gives passage to vast amounts of freight annually. One would think that the activity of our lake commerce, and of our coastwise barge traffic, which so much resembles it, would lead those among us who are interested in cheap transportation to appreciate such a method of carriage at its full value, and to take serious steps to develop it on our great rivers, or, where they do not exist, by canals.

At all events I have said enough, I think, to show how highly important Europeans think that a river or a great canal, properly developed, is to the commercial activity of a port. Its tributary canals assist it to carry commerce throughout the interior country back of the port and return it again to that centre, just as the human arteries and veins carry to and fro the life-blood of humanity.

III.

Railroad and Transit Facilities.

The surprising impression is left on a traveller's mind that in Northern Europe water communication for bulky freight is almost more important than that by railway. Hamburg absorbs vast amounts of traffic for which an American would consider Antwerp or Rotterdam the natural port, as being nearer outlets to the open ocean. Thinking, as he would, that railroads are the only effective means of inland transportation, an American naturally inquires by what rebates or preferentials Hamburg entices this great trade. Of course, primarily, it is due to the

activity of the business men of Hamburg. After that it arises from the water traffic on the Elbe, which is three times that done by rail. These are the causes of Hamburg's supremacy, for there are no railway rebates, and the German railway rates are "based upon distance, irrespective of direction." Those who ask for preferences would not gain any satisfaction except when a combined effort of the traders of a district might cause the established rate for a certain service to be changed by the Government for all concerned. It is true that to encourage German commercial and industrial interests and to meet the severe competition of Dutch and Belgian ports, the German State railways do grant exceptionally low rates to Hamburg and Bremen for merchandise to be exported, — considerably lower than for the same quantities of the same goods for local consumption. In this Hamburg does have an advantage over Antwerp for the export of German merchandise. Except for this, however, I think all comers and their goods are treated alike by State railways.

In England, or in any single State in America, when a railroad discovers a struggling industry developing under certain advantages, but far from its market, and competing with a more prosperous rival nearer the market, it may assume the rôle of Divine Providence. It may, by carrying the former's freight cheaply, gradually develop it into a prosperous competitor. Many American towns owe part of their increase and prosperity to such causes. These methods of development may or may not be good for the railroad and for the country, but they seem to form no part of the system when a railroad is in the hands of the State. In Belgium the railways are built or owned by the Government and the charges are said to be unit charges per ton kilometer for each kind of goods. Here, more than elsewhere, apparently, railroad prosperity has been made the means of lowering rates and fares and increasing facilities for trading. The railroads seem to be profitable, but are looked on less as a commercial enterprise than as a stimulus to national prosperity. The German railways since Bismarck's time are owned and run by the State. They are run for the cost of service, with a profit for the benefit of the State, and the rates do not fluctuate more than those of the post-office. The direction is in the hands of the Minister of Public Works and twenty-one directors, and English people are wont to compare this compact management with the Board of Trade and the three thousand directors that manage English railways. In France the roads were built largely by the Government and then leased to companies at four per cent. The companies supply stations and rolling stock. After the companies get four per cent the surplus income is divided between the Government and the companies. The Government investments are paid for by three per cent consols, so they start with a one per cent gain, which is increased by taxes, free carriage of mails, use of telegraph poles, and after ninety-nine years they possess the plant. The Minister of Public Works has the right to fix, raise or lower classification, rates or fares. There is a special lower rate on goods exported to neighboring countries. In Holland the two railways were built by the Government and rented to private companies. In England the railways are wholly controlled by private corporations, and competition has led them to extend their activities far beyond their immediate province. They maintain not only dining cars, but hotels, and not only trains, but docks and steamships tributary to their lines.

The ordinary traveller can discover but little difference between the private and the State control. To him, even amid the undeniable luxuries of the fast through expresses, the entire outfit of European locomotives and trains seems like a toy when compared with our vastly heavier trains. In England, in 1900, the average freight train load was about 50 tons, the train load in short being equal to one of our 50-ton carloads. Indeed, an American locomotive of 125 tons is no such astonishing thing, and the Illinois Central Railway has some trains of a gross weight of from 1,076 to 1,511 tons. No wonder, then, that the American traveller is much surprised at the European railway service which he encounters. He remarks on the splendor of some great central stations and guesses that beneath the rich detail there is some political significance. If asked why Euro-

peans do not adopt our heavier and larger cars and tracks he cannot answer. Perhaps it is because, having started otherwise, the necessary change of roads, bridges, and tunnels would be difficult. Perhaps, also, Europeans do not fully appreciate the superiority of our tracks and rolling stock, just as on our part we are blind to the usefulness of waterways.

The advantage and disadvantage of State and of private control are frequently weighed now by writers and speakers in Europe and perhaps especially in England. Great books are written and do not exhaust the subject. This paper is not the place to weigh up the conflicting views or to advocate one or the other system of management, but without expecting to throw much light on this vexed question a few notes as to the arguments most heard seem proper. Many objections are urged to State control. It is said that "the system operates like a Government instead of like a commercial undertaking"; that "instead of the public being better served because the State does not seek to make a profit, in reality the State is more concerned in showing a profit than in providing facilities which in themselves would not be directly remunerative"; that it leads to "a lavish expenditure where political or other special considerations arise, but elsewhere to parsimony"; and the rather gorgeous station at Antwerp is quoted as an example of this sort of splendor, while other places lack ordinary accommodations. (Plates 2 and 3.) It is argued that the German Government makes money out of the railways in order to pay for work in other departments of the Government and that thus railway tariffs are high in order to help other State Departments at the expense of commerce. Hence it is asked whether the State should run them for revenue or transport, and Bismarck's remark is quoted, that "Railways are meant far more for the interests of traffic than for the interests of finance." People complain of centralization and of an excessive amount of red tape; of a want of initiative and commercial instinct, and of the absence of a sense of responsibility to the different classes in the community. They may even more reasonably complain of exaggerated intrusions of political parliamentary influences, as in the creation of new stations and in tariff concessions to industries in which numbers may be interested. It is argued that private ownership is better than public ownership, because, under that system, there is found "a devotion to heads of departments, who all have more or less responsibility and freedom of action and are promoted for distinguished ability"; that only such a staff is employed as is needed to meet the requirements of the work; and that there is "an individual responsibility under company management, which makes for efficiency and the development of initiative."

On the other hand, in favor of State control or railroad nationalization, it is argued that it would do away with wasteful expenditures attending competition, such as boards of directors, expensive offices and agents and advertising; the duplicating of depots and lines; the watering of stock and rate wars, and lawyers' fees before legislatures. It is urged that a single control of the railways would open the way to frequent light trains, to uniform fares for limited zones, and to running steam railways in these and other ways like electric street railways. In that event, one conductor would sell the tickets on the train and the station master would collect them, the ticket offices being abolished. It might also lead to uniform charges like those of the post-office, or a single rate for any distance for different classes of goods.

There can be little doubt but that the community gains by the combination of many small lines into a few large ones. That is the spirit of the times in all business. This can be accomplished by individuals, or the State, or by both combined, or by private enterprise submitted to some disinterested control, as in the case of the Philadelphia Belt Line, described later in these papers. I am told that in Germany a voice in railway management is given to a number of local advisory boards and in them the merchants and manufacturers of the district are represented. If their deliberations were public they might with us forestall some litigation before the Interstate Commerce Commission. The Anglo-Saxon mind has always preferred those things which give opportunity for individual exertion and energy, although we are accustomed to public ownership of roads and bridges and the public management of the post-office. In most foreign countries

the telephone and the telegraph are also in public hands. Probably "the true line of distinction between things the State may and may not take up is between things that can be multiplied indefinitely and where there is effective competition, and things which cannot be multiplied and have no effective competition."

Boston has for long been a constructive community. At first she built ships and sailed them until that industry was destroyed by the embargo and the "Alabama" and by a protective tariff in the guise of laws which denied American registry to foreign built vessels and required a majority of American citizens as sailors on vessels under the American flag. Then she built turnpikes until the advent of railroads spoiled that investment. Then she built the mills of Lowell and Lawrence, and then helped to build the railroads and develop the cities and the copper mines of the West, and the telephones throughout the country. As a friend points out, her hands are exceptionally clean, for, as one by one these great enterprises become realities, they too often become interesting to the stock market. At that point they leave us for greater centres of stock jobbing and Boston starts on something else. Boston is essentially a constructive city, but, curiously enough, her energies for long past have been expended away from home. Perhaps the time now has come for her to develop her own home resources. It may be that there is as much wealth to be gained here in Massachusetts now as in the great West of the past, and with State encouragement perhaps private enterprise may find it worth while to better the distributing facilities at our port and our through connections with the North and Northwest.

As connected with the subject of steam railways I am tempted to print a tabular statement taken from Cunningham's "Railway Nationalization," and which presents many details that are of interest. (See Appendix No. 1.) It is apparent, if this table can be relied on, that we are better served than many foreign countries.

If the steam railways of Europe seem to the American a little behind the times, I do not think he brings away that impression about the street railways or elevated roads or subways. This sort of service seems modern and satisfactory all over Europe, and comparisons with our service may be of interest.

One early notices that the trolley posts instead of being of unfinished wrought-iron pipe have cap and base mouldings and a neat terminal. Sometimes they serve both as trolley standards and for street lighting. Sometimes, as at the head of the Binnen Alster in Hamburg, they are very large and ornamental affairs, with great scroll brackets, and a great deal of ornamental detail. The same attention is given to lamp-posts and telegraph poles, and the latter in Amsterdam, very lofty and very far apart, are almost ornamental accessories to the streets. (Plates 4 and 5.)

In almost all cities a fare entitles a passenger either to a seat or reasonable standing room. Sometimes no standing passengers are allowed. Elsewhere the number that can stand in the car or on the platform is limited and adhered to, conspicuous signs stating what is allowed. To make up for these restrictions more room is given by means of trail cars, or of a second story on the roof of the ordinary car. Sometimes such a double-deck car is trailed behind an ordinary car that has the trolley — and sometimes the upper deck is glazed in except for agreeable open balconies at the front and rear. In some cities there are first and second class seats at different prices. Also, suggestion is made in some places of having the fare vary for different directions at different times of the day — with a view to inducing an equal use of the road at all hours.

The elevated railways in Berlin and Paris are very carefully studied. They have a great advantage over American roads in that, instead of being crowded into streets already occupied, they run in the centre of wide avenues, with a roadway on each side of them. Thus there is no difficulty about having the supports of a size that seems to the eye sufficient, and as the floors on

which the cars run are tight, the walk beneath them between the supporting columns is comparatively noiseless. Furnished with seats and lamps this covered walk makes an agreeable promenade both in Paris and Berlin, and in the latter city it is called "the umbrella of Berlin." (Plates 6, 7, 8 and 9.) Where the Berlin road descends into the subway at the Nollendorf Platz, it is rich in detail and surrounded by foliage, and it is almost an adornment to the city and certainly not a great disfigurement.

The Paris road has two focal points of interest in its two bridges across the Seine, on which much care and expense have been lavished and which are really of fine appearance. At one of them, the "Pont de Passy," the elevated road is carried on very frequent posts in the centre of the bridge. A walk goes beneath it between the columns, and a roadway is on each side of the walk. The balustrades, the wrought-iron posts, the hanging lamps, and the approaches where the bridge-work joins the Doric design of the regular elevated road, are all designed with masterly care. (Plate 10.) If we compare with this very beautiful bridge the treatment of a very similar problem at the Charlestown bridge, on which is carried our elevated road, we have a very good example of what study and expenditure can do for the ornamental treatment of engineering.

The stations and rolling stock in the subways of London and Paris differ very little in any general way from what can be found in Boston and New York. Both in London and Paris these stations are ample, and finished with simple tunnel vaulting. It must have been difficult to construct such regular rooms among the sewers and conduits of an ancient city. They are generally covered throughout with white tile, and the more simple they are in finish the better they look. Advertising is confined to regular spaces, and the posters are so well designed that the advertising is a real interest and ornament when thus restricted to framed spaces.

London as yet has no elevated road, but it is under-run with County Council subways, underground railways, and two-penny tubes. The underground railways are now old, somewhat stuffy, and disfigured with advertisements, so that one with difficulty finds the names of the stations. That they get you quickly from place to place is about all that can be said for them. The London subways are much like those in Berlin, Paris, New York and Boston. The variations are only in detail. The London two-penny tubes are remarkable creations. (Plate 11.) You descend by lifts running in giant caissons, carrying 50 to 100 people, into the bowels of the earth. Sometimes the return lifts land you by doors directly upon the street. Once in the train you are shot to your destination in cars that nearly fill the bore. On the way you feel much oppressed by poor air, or the lack of even that, and you wonder what is to happen if the train gets on fire, or there is a collision, for there is not room between the car and the tube walls for you to escape. One tube carries you forward; by another tube the train returns; and between the two are island stations. You make the journey very quickly and cheaply.

The auto-omnibus is a means of conveyance that is so rapidly gaining favor and coming into use in Berlin, Paris and London, that in any notes on municipal transit it seems proper to refer to it. One who has not been in those cities for three or four years would be amazed at the hold they have taken on the public favor, and at the speed with which they fly through the Linden, the Strand, or the crowded boulevards. It is a wonder that they are not a great source of accident, but nobody seems to mind or fear them. People have become trained to them, and they are really under such control, and are so quick in action, that possibly they do possess advantages not inherent in the omnibus or in trolley-driven cars. One knows where the latter are going and can avoid the place,—the auto-bus minds its driver quickly and can avoid you. It is said that the auto-bus lines do not pay profit, but in spite of that they seem to be a method of public conveyance that has come to stay, and many think that they will always be preferred in crowded thoroughfares to trolley cars that cannot dodge and must block the way. Perhaps their ultimate destiny will be to carry people through dense parts of the city to outer regions where elevated express trains can speed them on their way.

I saw no actual example of a trackless trolley car, but they seemed to me to present a whole line of fruitful possibilities. An overhead double trolley wire is strung over the road to be followed. The car is directed in a general way under these wires, but the trolley-rods are long and flexible, and permit a considerable divergence from the path. At intervals there are four overhead wires, permitting one car to pass another. I should think that lines could be run cheaply and satisfactorily all through country regions where there are good roads by this device. Plate No. 11 shows how these lines are built. A similar method of providing power without tracks has been applied in many places to canals. The trolley wire is strung on posts, and the car that pulls the boats runs on the old tow-path.

Finally, I would draw attention to the lines which exist in some parts of Europe, though I did not see them, and which depend on a single overhead rail from which the cars hang, the rolling wheels being above the car. In some cases a single post placed at intervals on the route carries the pair of single tracks, the spread being less from this single post to the centres of the single tracks than it would be from the same posts to the outside of the rails of ordinary tracks. (Plate 11.) In other cases there are two posts at each bent. In either case the fact that the whole roadbed of sleepers, as well as half the tracks, are done away with, makes this sort of road far less of an obstruction to light and air than ordinary elevated structures. It seems for that reason a most desirable type of road to consider for the narrow streets into which we crowd our overhead railways.

It is proper, before leaving this subject of transit facilities, to say, that though foreign cities may offer suggestions of detail to us in Boston, there is no city, so far as I know, which has such a close-woven network of trolley lines as Boston. There are few, if any, where one can go so far and by transfer to such varied places for a single fare as on the lines of our Elevated Railway.

IV.

Docks.

The importance of a port depends upon the resources of the region it serves, on the lines for through traffic that radiate from it, and on the preferences of shippers. Trade is, however, variable, and sometimes surprises the wisest by neglecting ports that offer recognized advantages to favor others that have to be built up. Still, no port, however advantageously placed, can advance far without providing alluring conveniences to attract trade.

Adequate depth, good shelter, sufficient equipment, and scope for extension — these are the fundamental conveniences needed. When the variations of tide are small, vessels can rise and fall with it as they lie at the piers. When the tide is great this proves an inconvenience, and gated docks, which keep the water at about high tide level, are required. Such docks are not usual in any American ports. They have always been thought necessary at Liverpool, London and Antwerp, and many other places. Not only do they furnish tideless basins, but they diminish the amount of excavation and walling that would be required for a dock good for low tide. Even without any gates, docks have their uses and are often necessary; for where the accessible harbor shores are limited, large basins increase greatly the shore line where vessels may discharge.

The economical site for docks, and the kind of site usually chosen abroad, is found on low, level, unoccupied land or flats, within reasonable distance of the city, telephones and rapid transit making immediate contiguity with the city unnecessary. Land on the existing business front of

a city is usually too valuable for these purposes and makes the docks cost too much. Besides, such a location creates a demand for new streets of approach, or new railways through the settled city, and this is hopelessly expensive. The Bush Terminal Company's premises in South Brooklyn avoid all these troubles. The basic idea from which they start is to found factories in immediate proximity to docks and terminal facilities, and on cheap land, at some distance from the active city centres. They also provide transportation by train to the docks from the factories, and by railroad car lighters that cross the river from the docks to the railroads at regular hours. Thus the entire plant may be new and modern, all branches of business may be in close touch, and the public is at no expense for new and expensive thoroughfares through a crowded city. The Bush Stores system resembles the manufacturing district which is in the midst of Hamburg's free port and to which I shall allude later. It is, however, a more complete combination of dock, warehouse and factory than exists at Hamburg, and, whether it is prosperous and meets the special needs of Brooklyn or not, it certainly offers the best general model that I have heard of for a seaport. (Plate 12.)

So far as regards general arrangement and mechanical equipment of quays and docks, there is much agreement in recent foreign examples. The immediate front of most cities is occupied by quays. To receive great numbers of ships at a continuous quay would make a prodigious length necessary and hence the builders revert to docks, generally dug out of the fields, the water being let in after they are built. The size and area of these docks increase with each new example, not only in length of frontage but in width of pier and breadth of the water area in the basins as well as the proportion of quay frontage to dock water area. The docks now contemplated at Antwerp (Plate 13) and Rotterdam (Plate 14) are vastly larger than anything heretofore thought of in all the dimensions I have named. The basins are made large, not only so that a vessel can turn, but so that many of them may lie free in the basin, moored to fixed mooring stations. Here they may load and unload by lighters without ever touching the pier. If they do lie alongside the pier it is probably at a pier long enough to receive several of the largest size ocean steamers.

In America the pier sheds come close to the water's edge. The cargo is moved partly by booms hung to the short masts of the vessel and worked by donkey engines on the steamer, and partly by tackles worked from some central station in the shed. But almost everywhere abroad a walk with a railroad on it runs on the outer edge of the piers, and over this are great numbers of travelling cranes—one wheel on the sill of the quay and the other wheel on the eaves of the shed. A crane can be placed opposite each hatch of every vessel at the pier and the cargoes are transferred to and from the vessel, or the shed, or the waiting railroad train, or carts in the street that runs between the cargo sheds for the whole length of the pier. The cranes are worked either by steam or electricity or compressed air or water, a central plant supplying this power. (Plate 21.) Besides transporting the cargoes from the sheds by cart, or by trains that are controlled by the dock people, much dependence is placed on moving goods to other steamers or storehouses by lighters, because there is no method of moving such goods that is so cheap and so handy. Hence due arrangements have to be made for this work. The sheds are made large enough to contain complete cargoes, or rather two cargoes for each ship. In one the incoming cargo is placed without piling and open to inspection by the authorities. In the other, the outgoing cargo has been collected and is lying in neat order ready to be placed in the vessel in the proper sequence for rapid discharge at the port of destination. Well-lighted and ample floor space in these sheds is the fundamental need in the rapid discharge and loading of vessels. Besides these sheds, it is necessary to make provision somewhere for storage warehouses and grain elevators and dry-docks and repair shops, and special regions are devoted to the oil business and to lumber and coal. Moreover an essential part of the organism is such a system of railway as will put every dock in connection with every local railway.

Such are the elements that go to form a modern port.

In foreign ports the building of docks and quays has, to a large extent, fallen to the Government. The works at the French ports, at Hamburg and the other German ports, or at Antwerp, Rotterdam and Amsterdam, have been at the cost of the Government or municipality, or both combined, even though after construction they may be leased more or less to private companies. England has not adopted public ownership so much. At the smaller ports, like Barrow, Grimsby, Sunderland and Hartlepool, the docks are generally owned by steamship companies that serve them. Hull has a Hull Dock Company. The Cardiff docks owe their existence to the late Lord Bute and their prosperity to the construction of the Taff Vale Railway. Swansea has a Public Harbor Trust, like the Mersey Docks and Harbor Board at Liverpool, organized with the aim of benefiting the town. Newcastle, Glasgow, Dublin, Belfast, Aberdeen, all have Harbor Trusts. The control and increase of the docks of Liverpool are combined under a single Dock Trust, and those of Glasgow are managed in a similar way, but those of London belong to several independent companies. In this latter case private ownership may quicken activities by competition, but it certainly makes united action for bettered conditions very difficult on the Thames.

There are obvious advantages in the public ownership, or at any rate public control, of a port. Instead of this or that distributing railroad controlling the situation, the port may be open to all railroads, and all sailing and steamship lines and all tramps. Portions may be leased, but other portions would welcome all comers. United action between all parts of the port becomes more possible under a single public authority. Railway connections can be more readily organized. Areas of land for dock extension or warehouses can be obtained with greater facility by a public body than by a private corporation. On the other hand, a public corporation is subject to the malign influence of politics when it should regard nothing but business. Beyond all, it is subject to apathy, and is not braced by competition and that desire to get business which nerves private corporations to action.

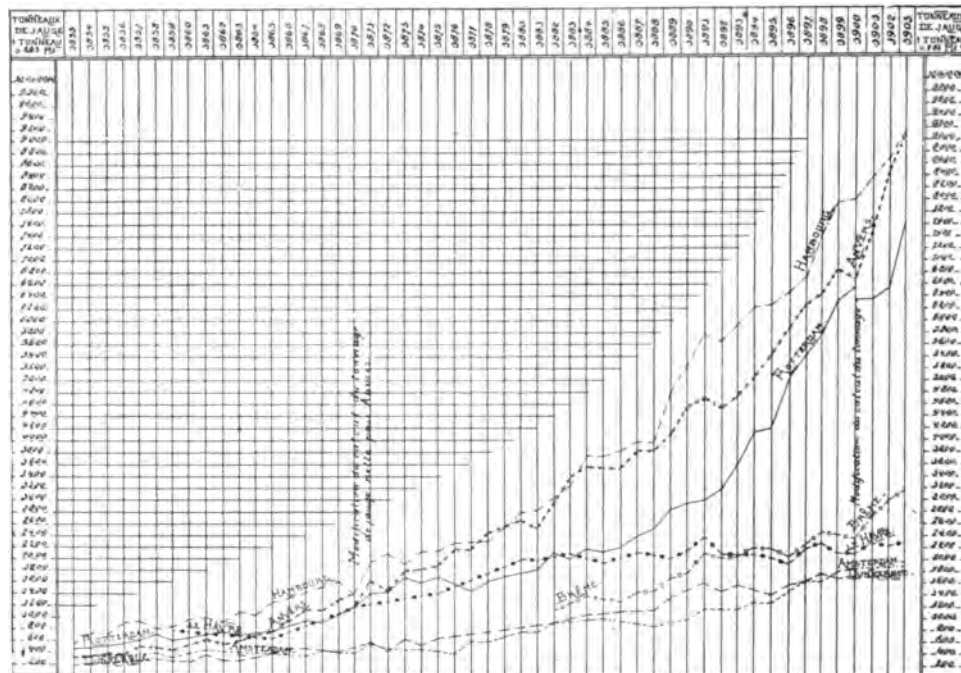
Among all these examples of ownership and management perhaps the Mersey Dock and Harbor Board at Liverpool is the model that deserves the most careful study by Americans. We are shy of public ownership, even though it does sometimes produce good results, especially abroad. Besides, a city in the financial condition of Boston is not able to invest large sums in docks. It is, however, conceivable that for the control of public docks and a terminal railroad the City and State could combine their powers and authority with private capital in an enterprise placed permanently under the government of Trustees chosen by constituencies like those which elect the Liverpool Dock Board. This Trust is composed "of twenty-eight members, two of whom are nominated by the national government, and the other twenty-six are elected by a restricted constituency made up of those citizens of Liverpool who pay dock rates or taxes; that is, the control is like that of a mutual insurance company, in which those who take out and pay for policies are entitled to vote for members of the Board of Directors." An election to membership in this Trust is esteemed an honor by any business man in Liverpool, and the first merchants of the city are its members. Starting from the experience of Liverpool, we might, perhaps, by joining State encouragement to private enterprise, discover a means of accomplishing what we desire. What, in short, might help us would be State authority to work under, private capital to work with, and disinterested control over the completed work of docks and terminal railroads.

V.

Commerce.

Commerce will always follow the lines of least resistance. Man, however, can oil the wheels and level the roads, so that a poor road thus cared for may offer better travelling than a neglected good road. Without active human assistance, trade would never have had its present development in German ports. It would have gone to Antwerp or Rotterdam. Again, without the building of the "Waterway," Rotterdam would have been a very feeble rival to Antwerp. All ports cannot be the highest on the list, but any port can better itself. The prosperity of Antwerp and Rotterdam do not shut off Amsterdam from her proper career. Because New York is great is no reason why Boston should not be prosperous. The rise and the comparative prosperity of the commerce of various cities is best shown by a table. In those presented herewith, it is easy to see that large investments and the supply of adequate machinery have gone hand in hand with a great increase of prosperity. It may be said that the converse is the fact and that the means were developed to meet a demand. The real underlying fact, however, is the same here as in every other human endeavor. The most valuable force in the accomplishment of these great undertakings, greater than the natural demand or the ingenious machinery, was the human intelligence that saw the possibility of a demand, and the human courage and civic pride which made ready against its coming.

The following table shows at a glance the commercial history of various ports of Europe. It has been taken from the "Port de Rotterdam," by Van Isselstein.



TONNAGE DE JAUZE DES NAVIRES ENTRÉS DANS LES PORTS DU CONTINENT.

The Department of Commerce and Labor has just issued (September, 1907) some statistics of transportation, and the following table taken from that report carries to a later date some of the records given above as well as those of several other ports.

Vessel-Tonnage Movement at various Ports during the Decade 1896-1906. From "Transportation Routes and Systems of the World," Published by the Department of Commerce and Labor, 1907.

CITY.	YEAR.	ENTERED IN THE FOREIGN TRADE.		CLEARED IN THE FOREIGN TRADE.	
		All Vessels. Net Reg. Tons.	Steamers. Net Reg. Tons.	All Vessels. Net Reg. Tons.	Steamers. Net Reg. Tons.
Boston and Charlestown	{ 1907 1897	3,018,888 1,943,582	2,934,223 1,688,208	2,244,124 1,634,120	2,123,625 1,406,142
New York	{ 1907 1897	11,383,345 7,267,480	11,067,126 6,465,295	10,472,601 6,934,835	10,162,340 6,117,439
Philadelphia	{ 1907 1897	2,330,853 1,539,401	2,237,887 1,335,892	2,334,206 1,411,404	2,226,773 1,190,254
Baltimore	{ 1907 1897	1,419,732 1,253,072	1,400,932 1,189,655	1,496,211 1,519,397	1,478,855 1,465,089
London	{ 1906 1896	11,222,542 8,903,285	10,754,446 8,114,110	8,185,400 6,588,910	7,777,557 5,871,255
Liverpool	{ 1906 1896	8,145,441 5,643,514	7,971,158 5,228,473	7,125,417 5,239,510	6,938,309 4,829,844
Manchester	{ 1906 1896	1,223,239 480,627	1,209,770 451,132	1,077,599 364,151	1,067,261 346,923
Glasgow	{ 1906 1896	1,842,416 1,289,377	1,796,243 1,208,846	2,956,410 1,902,330	2,893,906 1,800,610
Cardiff	{ 1906 1896	5,295,331 3,957,920	5,185,797 3,546,329	8,193,312 6,947,224	8,022,034 6,136,260
Hamburg	{ 1905 1895	9,408,000 5,681,619	8,993,000 5,230,398	9,516,000 5,837,294	9,028,000 5,357,453
Amsterdam	{ 1905 1895	1,619,154 1,151,811	1,603,643 1,111,323	1,548,068 1,177,403	1,534,751 1,127,454
Rotterdam	{ 1905 1895	7,868,819 3,859,622	7,649,096 3,699,685	7,696,416 3,808,404	7,479,178 3,642,362
Antwerp	{ 1905 1895	9,864,528 5,360,824	9,606,996 5,099,149	9,800,149 5,318,488	9,527,126 5,067,691
Havre	{ 1905 1896	3,245,000 2,114,842	.... ....	3,333,094 2,767,449	........
Marseilles	{ 1905 1896	6,410,384 4,032,259	.... ....	6,578,082 4,279,146	........
Genoa	{ 1905 1895	5,132,159 3,350,097	4,986,515 3,179,296	4,797,722 3,056,607	4,675,661 2,920,852

VI.

City Planning.

It is from Posen that many of the poor Polish Jews come who are huddled into the East Side of New York. We are not used to think of it in any way as a model city. But when I told Professor Stübgen that I liked his work in planning the later suburbs of Cologne, he said that plan was rather out of date, and perhaps his newest and best work was at Posen. It amused me to hear Posen advanced as a type for Boston to follow.

When Baron Haussmann, with the power of Napoleon III. behind him, renovated the city of Paris, he set a model for all city planning for a long while afterwards. Broad avenues led from Column to Arch, from Arch to Opera House, from Opera House to Palace, and from Palace to Church. Sometimes they were continued for long distances without interruption, but always they were lined with buildings of the same stone and of a fixed height, and bordered with trees all of the same kind and same size. Of course, this grand style was modelled in the spirit of Le Notre's garden work at Versailles, or Gabriel's in the Place de la Concorde, or Mansart's in the Place Vendôme, — in the spirit, in fact, that the École des Beaux Arts nourished. But in most of these and other grand plans of the older period, the broad schemes had been bounded and limited to spaces readily comprehended and enjoyed. Never before in cities that sought pictorial or architectural effects had streets been so continuous and vistas so long as in Baron Haussmann's Paris. It was even asserted that they were thus made that riots might the more easily be controlled. However, the city thus arranged proved so magnificent and so monumental that every French city, large and small, and many in other countries, forthwith endeavored to renovate their streets on similar lines. (Plates 33 and 34.)

But grand as the effects are, there were those who longed for more individuality of expression in form and color and more variety in the streets. They asserted that the recent streets lack in surprises, and that the constant repetition of the same type of house and the same trees and the same monotonous view is fatiguing. The houses present a continuous front without irregularity or individuality and the laws prevent gables and projections and compel a fixed height and a perfect alignment. The straight line triumphs, and writers do not mean it for a compliment when they say that this absence of accidental effects or silhouettes reduces their beautiful city to an American monotony and mediocrity.

M. Hénard has been especially prominent in urging that new projects in Paris should depart from the Haussmann type. He points out that the old boulevards (made by Louis XIV. on the site of the ancient walls) were really interesting. They were wide and changed direction frequently; the buildings fronting on them had variety in height and alignment; green trees gave pleasant shade and an agreeable contrast with the stone walls, and throughout they had a charm which even to this day they possess. This charm by degrees has vanished from the new boulevards and the new streets. His cure for these troubles is to build streets and boulevards with less regularity, and he offers an interesting suggestion, which is shown in Plate 31. In this, trees and buildings alternating give variety to the perspective. The advanced fronts would have a treeless street; those in retreat would open on little shaded courts, where the trees would be cared for as now by the city.

But M. Hénard's studies are not confined to these suggestions for the boulevards that are at some day to take the place of the outer fortifications. He has also studied the circulation in and about Paris, and suggested new routes and made comparisons with the circulation in other cities. These studies are so interesting that I show them in Plate 32.

A tree but for disturbing causes would be perfectly regular. It would have a straight trunk and a symmetrical bouquet of boughs,—but shade or wind or lack of food often distorts it. It may have all the more character for the changes that come from such accidents. M. Hénard in making these theoretic schemes has reversed the process of nature, and from the more or less tortuous and irregular facts has extracted the ideal theory that governs the plans of the cities he illustrates. He shows how Moscow centres in and radiates from the Kremlin, the citadel of political, religious and military authority in Russia. In Berlin fourteen great roads connected by a circle radiate from the seat of this military government and lend themselves to effective and economical expansion of the city on all sides—an expansion which is in vigorous progress. In London there are three principal civic centres; Trafalgar Square, the Bank, and the Elephant and Castle. From the triangle thus bounded sixteen radial routes diverge. These, as in Berlin, lend themselves to city expansion, but London is deficient in circular boulevards, and the Parliamentary Commissions constantly endeavor to remedy this need.

Paris, on the other hand, has three circular boulevards, but is deficient in continuous radial avenues. Its great centres, the Arch of Triumph and the Place de la Nation, symbolize grandly military glory and the triumph of the Republic, but they serve no important currents of circulation. Under the Empire strategic questions dominated over those of circulation. In the main, however, Baron Haussmann's desire was to penetrate the regions that were full of unhealthy houses. There has been much talk since then of circular streets, grand cross-roads and connections between one and another quarter, but actual work has been more or less spasmodic. A crowded place has been made free, or a new way opened, but without correlation or a definite, large intention. For these deficiencies M. Hénard offers many interesting remedies which we need not detail. A study of his theoretic scheme-sketches (Plate 32) does, however, show how important it might be to a growing city to establish a large theoretic plan for its streets, and there is a certain comfort in learning that the present beauty and convenience of Paris was not obtained easily.

It is not unnatural that the Haussmannized Paris should find critics. It is always thus. There are two kinds of minds or of moods,—one that seeks the even, balanced designs where individuality is sacrificed to the general effect; and another kind which hails every expression of individualism, every picturesque and varied incident. One is the attitude of the classicist, and the other of the romanticist. They seek different modes of expression in literature, in painting, and in all other forms of art, and so it happens that a school arose that criticizes Paris, or, perhaps even more, the feeble provincial imitations of Paris.

When Germany got her new wealth and spent it in renovating and enlarging her ancient towns, she tore down their ancient walls and converted their site into boulevards, as in the old days Louis XIV. had done for Paris. The new school, however, refused to accept Baron Haussmann's artists as the infallible and only guides. The analytical, patient student mind of Germany, applying itself to these subjects, looked to past history and said: "The cities of ancient time, whose beauty we cherish and study, were not thus built. The Piazza della Signoria, the market square in Verona, the public places of Nuremberg, the Duomo group at Pisa, were not even or rectangular, but, on the contrary, very accidental. Michael Angelo did not choose the centre of the Piazza as the site for his David, but the side of it, where it was backed against the rugged walls of the Palazzo Vecchio. Even the Acropolis at Athens was not arranged with symmetry, and the forums of Pompeii were full of accidental effects. The charming streets of Bruges were not of interminable length, nor were they straight, nor did they end on a great monument. They were winding and with frequent and unexpected incidents in the way of market places, which they passed rather than traversed. When the cathedral came into view it was not lost in the middle of a plaza, and thus dwarfed by contrast as is the Dom at Cologne or the west front of Notre Dame at Paris, but framed by the opening of the street and supported by the old

houses that clustered against its sides, as at Chartres and Antwerp. Even in Rome of the Renaissance, where grand places like the Piazza del Popolo and the Piazza of Saint Peter's are axial, or in the balanced courts at Nancy and Versailles, these regular compositions are good partly because they have modest limits and good perspective effects, are self-contained and make pictures that are easily comprehended. Straight streets are sometimes needed to-day, but their mechanical use without artistic consideration of the ground or local circumstances is to be condemned. If the waving line in streets is more picturesque, the straight line is more monumental. Neither one nor the other should be abused, but both should be appropriately used."

Thus it appears that there are two quite marked and varying views as to the subject of town planning, and that it is a subject well worthy the attention of the best of artists, although the authorities of most American cities would not recognize the need of anything but Yankee common sense for its solution.

The Germans have discussed all this subject widely in print. Herr Sitte, of Vienna, was the earliest writer on the subject, publishing, in 1889, "*L'Art de Bâtir les Villes*." Burgomaster Buls, of Belgium, has repeated the same views in his "*Esthétique des Villes*," and finally, Professor Stübgen, of Berlin, has lately published, as the ninth volume of the "*Handbuch der Architektur*," his most interesting book, "*Der Städtebau*," or "*The Building of Cities*." It is illustrated with 857 engravings in the text, and 13 plates, and shows Professor Stübgen to be a true German scholar, studying all sides of a subject, and leaving nothing hidden that can help to solve a question; a scholar, too, of practical experience, for he has carried out designs of his own for extending Cologne and many other cities, and is the author of prize designs for Aix-la-Chapelle, Dresden and Vienna.

We can sympathize with the distinguished Belgian architect, when he says: "We should not like to see our Belgian architects imitate the tasteless constructions, overladen with cement ornaments, with which the German architects line the streets of Berlin, Hanover and Cologne. What we advise is the employment of the German method of study of these problems, in order to find solutions that do meet our taste." One cannot but admire the close and detailed study that the Germans have given to these subjects and the way in which they have summed up into theories the principles deduced from such ancient and beautiful examples as I have named above. Their books give their views about vistas and squares, about monumental buildings and the division of blocks of property. To state these would be too long an undertaking for this paper. They must be studied in their writings.

In regard to the streets considered as the arteries of a city, there is more agreement, for all schools believe that it is well to have certain main arteries radiate from civic centres, and others, forming concentric rings, connect these radial lines. In European cities the destruction of ancient ramparts gave great opportunity to form these ring boulevards, and what had previously confined and crowded the city proved its means of gaining space. Few such happy opportunities occur in our cities. After the radial arteries and the rings are established all substantially agree that there should be certain diagonal roads cutting across the polygons and leading to outlets on the outer ring. When this arterial system is finished the blocks may be cut up as the market demands. The newer school also teaches that main roads may be interesting which curve or wind, and that hence it is well not to have the main arteries all straight. They should also reach, at somewhat frequent intervals, objects of interest, such as squares or plazas, and these should each have an individual character.

If our cities and towns were perfect artistic productions one would find a pleasing picture wherever he turned; whether towards the great church, the public building, the monument, or simply down the public street. Everywhere a pleasing background would exist for the life of the city. There would be a continuous succession of agreeable impressions. There are occasional references in foreign books to the plans of new American cities, but only with scornful criticism

of their lack of this beauty. In fact, they are thought stupid. Professor Stübgen, however, was much interested in the opportunities that Boston offered by reason of the irregularities of the old town and its varied topography. "A beautiful old town represents an enormous artistic capital which pays ceaseless revenue in the form of grandiose or picturesque impressions. One finds little joy in living in some of our modern towns and can cultivate little attachment for them and accordingly little home sentiment." All that is old and beautiful should be, from its very rarity, a thousand times more precious to us than to dwellers in an older country. Hence it must be apparent that changes in an old city or the planning of a new city, or of part of one, are not to be undertaken lightly or unadvisedly. The differences between schools of design such as I have described create interest and throw light on the subject.

VII.

Rotterdam — Amsterdam.

All the morning your steamer follows the dim shores of France and Belgium. By noon you sight a lighthouse. Long sand dunes, flags, signals, and whirling windmills, gradually grow out of the horizon. Soon the vessel is speeding up between the dikes that raise the great river that bears you above the surrounding fields. The same vast expanse of sky and showery clouds lies over this broad, flat landscape as over the ocean you are leaving. The fields are luxuriantly green, or brilliant with market crops. Where man's handiwork appears it has been under the brush of a painter who has no colors but vermilion and sky blue and emerald green and white. Eighteen miles of this "Waterweg" — the canalized river Maas — have made modern Rotterdam possible and have given the Rhine a deep-water outlet to the ocean.

Rotterdam always had outlets towards the ocean in this direction through various branches into which the Rhine and Maas divide in this region, or through canals among them. Repeated improvements were made in these and plans were prepared for deepening and widening them, either by digging or by jetties and the scour of the currents. However, in 1860, the Voorne Canal, which was a principal means of access to Rotterdam, gave insufficient water for large vessels. They entered at Brouwershaven, were there partly discharged, and then continued to Rotterdam. The Suez Canal, however, at that date created a revolution in shipping in Rotterdam as well as throughout the world. In the old days sailing ships from the Indies took three and a half months for the voyage. In 1860 the journey could be made in thirty-five days. A large ship from the Dutch East Indies could no longer waste a fortnight in unloading part of its cargo at Brouwershaven before finishing its journey to Rotterdam. All saw that ships should arrive quickly, with complete cargoes, at their ultimate destination, and where their freight could be delivered at once in the city, or to the railroads, or to freight boats.

Thereupon Holland set to work to develop a proper system of railroad communication as a supplement to the inland waterways that nature had given Rotterdam, and as a still greater undertaking with great courage the City and State together built the "New Waterway," by which great liners now approach the city.

This Waterway was paid for in large part by the State but also partly by the City. It is about eighteen miles long, pierces the Hook of Holland, gives a depth of water of about nine metres below low tide, and offers free access to the Atlantic Ocean.

As our steamer hastens along, green fields give place to the busy port of Rotterdam, and we are soon in the midst of its industrious activity. In the stream, moored to giant piers of iron-

banded piles, of which there are twenty-eight, lie great steamships, each surrounded by a flotilla of lighters and barges. The cargo is exchanged with the lighters, and the ship, coaled from the Rhenish barges, can go on its way without touching a quay or paying dues of any sort. But forests of masts and smoke funnels show where there are also vast docks. They are open to the river, for the tide is not such as to make gates necessary. On the north side of the river, which is bordered by the busy tree-shaded street called the Boompjes, the smaller traffic is carried on and a view is had of the stirring business of this wonderful port. Most of the docks are south of the river. Rotterdam possesses a total of 460 acres of docks and 25.26 miles of quay frontage. Besides, there are the twenty-eight fixed moorings in the river, and new docks far larger than the last are now projected (Plates 14, 15 and 16) on the left bank of the Maas. When completed they promise to be of about the size of all existing docks put together. An American will probably note with surprise the statement in Mr. de Jongh's "Le Port de Rotterdam," that according to the latest statistics the transportation by railroad at Rotterdam is ten per cent of that by water. The whole commerce at Rotterdam in 1904 amounted to 12,291,460 tons.

All the works of the actual port of Rotterdam belong to, and are administered by, the municipality. The State has never given subsidies towards them. On the other hand, the river is controlled by the State, and, under contract with other States that border on it, is free to navigation. Together with other public municipal works the construction of the docks is in charge of six members of the Municipal Council, who have under them a director of public works, with a large corps of assistants and workmen. This Commission has charge and forms plans for not only port works, but water, gas, telephone and electric works for the city, as well as abattoirs.

Rotterdam itself is a lively, busy city, traversed by tree-shaded streets, through which flow canals. Around it are attractive green suburbs where the rich live. It bears the mark of business throughout, and of a prosperous and driving business. It is, in fact, the main outlet of the Rhine commerce. It is a city of agents and business men, and, though in Holland, is very near to being a German port. Nevertheless, Germany, in building the Dortmund-Ems Canal, endeavored to divert the Rhine traffic away from it and to Emden, and accomplished it for some of the Westphalian commerce. But for the great coal region and for the Rhine in general Rotterdam can hardly fail to remain the natural port which she is to-day.

Germany now is planning its vast Midland Canal, which, if built, will connect the waters of the Elbe and other rivers with the Dortmund-Ems Canal and will also be extended to the Rhine. The merchants of Rotterdam look to this with a hope that it will bring benefit to them. The agriculturists of Middle Germany fear it will open the road for cheaper foreign grain. This great canal has not yet been built, but if it ever is it will probably not only benefit interior Germany, but be more or less tributary to Rotterdam. Perhaps the Germans will not wholly mind, for they hope that some day Rotterdam will be actually a German port.

The present prosperity of Rotterdam is due not only to its fortunate position, but to the energy and foresight of a people who recognized their good fortune and courageously invested large sums for its development. Without that, Antwerp or some other rival would have obtained it. But these vast expenditures are paying an enormous return and have made Rotterdam one of the foremost ports of the world.

Amsterdam, which is the other commercial port of Holland, also has had to make most courageous investments to retain her trade and her position as a port, but her entire commercial and civic character is very different from that of the young and pushing Rotterdam.

The seventeenth century is looked back to as the golden age of Dutch commerce. The Dutch then ruled the waves, and all parts of the world knew the ships from Amsterdam, the great national seaport. Brooklyn, Van Dieman's Land, New Zealand, Cape Horn, Spitzbergen show by their names the adventurous spirit of the Dutch. Later, England for long competed with the Dutch for ocean supremacy, and with success, and when Holland, freed from the French, regained her independence, little remained of her maritime greatness. Soon steamers supplanted the sailing ships, and the entrance by the Pampus from the eastward into the shallow waters of the Zuyder Zee was quickly found to be insufficient for modern commerce. Then began a series of courageous measures which have kept the port abreast with modern times and methods. First (1819-1825), the North Holland Canal was built northward from Amsterdam through Holland to Nieuwediep. It is 50 miles long and has a depth of 25 or 30 feet. At that day an outlet westward to the North Sea was not thought possible, as there was no natural port on that coast. The new canal was intended to be a main artery of commerce, but is now little used by great ships, although we saw a large naval training ship going through it. A quicker road to the Atlantic being necessary, the North Sea Canal was built in 1863-1876. It runs straight from Amsterdam westward to the North Sea at Ymuiden, where an artificial port has been constructed. (Plate 15.) With the exception of the light draught boats that come in from the Zuyder Zee it bears nearly all of Amsterdam's commerce. It is 15.23 miles long. When first built, in 1876, it had a depth of 23 feet, but it has been enlarged and now has about 30 feet of water. All canal and harbor dues at Ymuiden have been abolished. Tidal gates at Ymuiden shut out the tides of the Atlantic, and the great Orange Gates on the east of Amsterdam (when they were built, the largest in existence, though since surpassed by those at the Canadian Soo Canal) close out the waters of the Zuyder Zee. The river thus barred forms a practically tideless basin at Amsterdam and hence one most convenient for commerce, as the water level is almost constant. This good access to the sea being gained, there still remained the necessity of building docks to receive the expected shipping. The docks to-day line the river above and below the city, and, in 1905, 3,038,641 tons entered the port. (Plate 15.)

At the water front of the city itself is placed the Central Railroad station. It is practically on a river island, and outside of it the central water front is devoted to local boat service to towns in the neighborhood accessible by canals and rivers. The through lines of railroad run along the water front and thus connect also the docks that lie at each end of the city. This arrangement is a very orderly and agreeable one considered as matter of design, but it is almost impossible to increase the railroad facilities in such a position. The situation is much like that which exists on the river fronts of New York City. Neither city nor river can be encroached upon. A connection around would have obvious advantages over the existing plan, and in 1901 a State Commission prepared a report considering some such possibility and illustrated with very complete and beautiful maps and plans. This improvement has not as yet been undertaken.

The harbor works were built by the municipality; the North Sea Canal by the North Sea Canal Company (subsequently taken over by the Government), with subvention by the municipality. The whole harbor is practically one dock, but it has 58,613 running feet of quay, besides 5,000 feet in the petroleum harbor. The ship yard and floating docks are all owned by private people. There are seventeen miles of railroad on the docks. The Rhine Canal runs 43 miles to the Merwede. It was built by the Government in 1892, and has shortened the connection between Amsterdam and Germany, making the journey from Amsterdam 134 miles to Ruhrort, 191 miles to Cologne, and 307 miles to Mayence. No tolls are charged. The passage is free. Moreover, to encourage Rhine commerce, no harbor or lock or bridge dues are charged on vessels arriving from and returning to Germany within one month.

Amsterdam has a civic character which is absolutely different from that of Rotterdam and which is most delightful. Long ago she gained wealth and prestige in colonial trade. She

retains that trade now, and is in every sense the commercial capital of the country and the emporium of colonial products. The "Dam" and the railroad station form a centre around which run the canals in concentric semicircles. Tree-shaded streets are on each side of the canals. Dignified, simple houses front on these "grachts," the abode evidently of long enjoyed wealth. Around this simple and aristocratic city are spread wide areas of new suburbs, laid out with thought and taste and variety and bordered by fine buildings. In every way Amsterdam is a charming and prosperous and impressive city. In many ways Amsterdam reminded me of Boston. When the modern revolution took place in the methods of transportation, a change which occurred throughout the commercial world, she, like Boston, had been a prosperous maritime city, but saw her prestige going to others. Undismayed by the evident fact that other cities with great natural advantages might outstrip her, she not only possessed the wealth but had the energy to make the very best of herself in the new order of things. Can Boston rise to her opportunities in like manner?

Before passing from the consideration of Holland to other subjects, I cannot refrain from referring to one other Dutch public work which is under consideration. It has nothing to do with maritime cities, but does show how a small country bravely considers large subjects. As is well known, all Holland, where it is not protected from the sea by natural sand dunes, is walled in on its entire borders towards the ocean by artificial dikes. In building these, much land is reclaimed from the ocean. This land is often below a high-tide level, and the many windmills are employed largely to pump the drainage water from such low-lying fields into the canals, which finally deliver it into the sea. Many large lake areas throughout Holland have been treated in this same way and become most fruitful fields. They are called "Polders." The scheme I refer to, and which is widely discussed, is to build a barrage across the northern end of the Zuyder Zee, which is nearly surrounded by land and has a depth in general of about 15 to 18 feet. The barrage being completed, the sea would be pumped out and the whole region converted into a fruitful "Polder." Five hundred thousand acres would thus be reclaimed at a cost of \$75,000,000.

Holland and New England are both small regions. Both have been prosperous leaders in the past. Both see prosperous neighbors surpassing them in the contest for modern supremacy; but Holland, at any rate, has not given up the contest because a neighbor prospers. On the contrary, as is shown by the great public works that I have described, she is doing the best that is in her. She is reaping her fair reward. There is much to be seen there that can give us in Boston subject for thought.

VIII.

Antwerp.

When the commerce of Belgium is spoken of it means practically the commerce of Antwerp. It is true that there are other places that have maritime ambitions. Bruges, once a prosperous port, but now left high and dry an inland town, hopes to become a real port. It has lately opened its ship canal. This begins with breakwaters on the open German Ocean, and from this entrance at Zeebrücke a ship canal runs $7\frac{1}{2}$ miles, and gives 26 feet of water to the new docks

in the old town at Bruges. It cost \$5,000,000, of which the State paid one half, the other half coming from the city and a company who have the right of working the canal for 75 years. This costly undertaking is hardly old enough yet to have a history. Brussels itself also means in good time to be a seaport. It has built great docks, now served by small canals; but, if its dreams are realized, there will some day be a ship canal 18 miles long from Brussels to the Scheldt for vessels drawing 20 feet of water. (Plate 17.) Ghent, also, is reached by ship canals 20 miles long, and has shipping docks that are to have 25 feet of water. Beyond these there are none but fishing ports on the Belgian coast.

It is a strange thing that in a country with a seacoast (even though it is small), and with a great port like Antwerp, there is little in the shape of a Belgian merchant marine. Although Antwerp is a town that lives by ships and shipping, they are almost universally foreign ships. Like the United States, she has practically no merchant ocean marine of her own. Yet you cannot be long in Antwerp without recognizing its marine character, and a view of part of the port's work is easily gained. A certain amount of the shipping lies at the quays which border the city, and the sheds for merchandise run down the length of the quay. Over the water end of this quay runs an elevated promenade. The business between the ship and the warehouse goes on beneath this promenade, but on the latter the good citizens promenade and watch the harbor and ships and the process of loading and unloading—a most agreeable occupation for one with time on his hands, and there seemed to be many such in Antwerp. (Plate 3.)

The quays on the water front of the town extend along the river Scheldt for miles. They form, however, but a small fraction of the port facilities of Antwerp. At them vessels rise and fall with the tide as in American ports. Beyond them stretches an apparently endless chain of docks. The docks have tidal gates, but otherwise have a strong family resemblance to those of Hamburg and Rotterdam, which I have elsewhere described in detail. It takes a long drive to encircle them. (Plate 13.) At the time of my visit a great strike among the longshoremen was in progress and the port was tied up. The number of vessels in port was prodigious. Endless rows of ships, barques and steamers lay by the quiet wharves, and nothing was doing. The tenseness of the rivalry between these North Sea ports was visible in the fears expressed by Antwerp people that the incident would set the port back, to the benefit of Rotterdam.

Large as the docks are they do not meet the ambitions or needs of Antwerp. A new vast dock is contemplated at Rotterdam, and Antwerp naturally cannot do less. They have talked of building it on the other side of the Scheldt, where Napoleon thought the port should be, but a scheme yet more vast seems to please the mind of Antwerp and may be carried out. Just below the present docks the Scheldt makes a great bow or bend. The project called the "coupure" is nothing less than to cut a new bed for the river through the land embraced by the bow. The river would be made straight. The old bed of the river, gated at each end, would form one new dock, and another vast one would be built opposite and below the great collection of docks already existing. Instead of the "coupure" another method of enlargement is also under discussion. Plate 13 shows both of these schemes.

Besides considering whether this vast project is to be carried out there is much discussion of great projects for the beautifying and enlargement of the present city. Many years since the old fortifications were taken down and others built in a large circle. The intervening space is occupied now by a new and splendid city, with boulevards that are almost too long and straight, and buildings of dignity and beauty. Now there is talk of taking down the later fortifications and building others still further out. Professor Stübgen has been engaged by the municipality to design a plan for this new suburb. It would be an entirely new one, for the town now ends with the present fortifications, outside of which is a country landscape. It is a question whether this zone will be thus added to the closely-built city, but the authorities have wisely ordered a plan which they can consider. The land would be in many townships and the first step is to cover

it under one domain. Then probably the city would take the whole, make the plan, and let out the lots on long leases in the English fashion. The chief discussion is, however, military. Antwerp is the final citadel of Belgium. It is strongly fortified and in a military sense the city is Belgium. Nothing, therefore, will be permitted that will endanger the military situation.

One thing in Antwerp I remember better and more gladly than docks or ships or people. High over all that restless scene of commercial activity rises the beautiful tower of the cathedral of Notre Dame. Above the ancient house gables its lace-like pinnacles shoot far upward, and from among them the music of its peals floats, as it has for ages, over ships and river and the great city, which year by year in ever-increasing circles grows larger at its base.

IX.

Hamburg — Cologne — Berlin.

Mr. Jules Huret, in his book "Rhin et Westphalie," shows how the present activity of Germany presents itself to a frank-spoken Frenchman. He says: —

"What we find in the Germany of to-day is the blossoming out of an ancient poor race on which fortune has smiled, and which, surprised and delighted, has gone to work and vigorously thrown itself into modern business and speculation, allowing itself every comfort. Some comparisons with France greatly interested me. In 1872 German general commerce reached $7\frac{1}{2}$ milliards; ours exceeded it by some hundreds of millions. To-day German general commerce has doubled; it is more than 16 milliards, and that of France remains $9\frac{1}{2}$ milliards. These total sums are composed of a number of details that are equally striking; German merchant marine quadrupling its tonnage in a few years, and the navigation companies doubling, tripling, quintupling their capital. As for the means of communication — canals, ports, post, telegraph, telephones — the increase is unheard of. Having only 20 million more inhabitants than France, the German empire has 47,000 post-offices against 11,000 in France, or one fourth the number, and England itself has 22,000. The German postal service employs 251,000 persons, being an increase of 6,000 persons in a year. The French service employs 82,000 and the English 188,000. The postal business tells the same story, the Germans handling 5 milliards of letters and packets against 2,700,000,000 in France. The telephone in Germany has 1,383,000 kilometres of wire, and in France 428,000 kilometres. The number of telephonic messages gives a fair indication of commercial activity. In Germany the count is 800,000,000 messages in the towns and 128,000,000 longer distance. In France the figures are 191,000,000 and 12,000,000. At present France has the longer telegraph wires, 154,000 kilometres against 137,000 in Germany; but the French lines are served by 14,600 offices and 18,000 instruments. In Germany there are 28,000 offices and 41,000 instruments. But these figures were not alone what struck me so much as the extent, seriousness and persistence of the labor itself. Germany, in fact, is hard at work, colossal, continuous work, which groans and roars and whistles and grinds from the ancient civilized western frontier, where nearly all the wealth of Prussia is massed, to the backward east, which is almost Slav; from the northern ports of Kiel and Stettin to the Bavarian frontier. In these great workshops of Westphalia and the Rhine valley, in the country around warehouses and ports, which I have visited by the hundred, I have heard no sound but that of machines in

movement and materials. As in the United States, no talk, no calls, no laughter . . . slow, very slow work, but without ceasing, like yoked oxen. It is this constant seriousness from top to bottom of the ladder, from the head of the business to his lowest laborer, — it is this resigned seriousness and blind acceptance of discipline that has made the country's fortune. They have gained much by it, these powerful iron masters, cotton spinners, tanners, bankers. Starting from nothing thirty years ago, like simple Yankees, to-day they are enormously rich."

This impression of the sudden and tremendous growth of the German nation must force itself upon all who visit Germany now, whether they go to the smoky country between Cologne and Essen — the Lancashire, the Pittsburg, of Germany — or traverse the great farming plains of Central Germany, or join in the crowded and prosperous life of Berlin. For me the power and commercial activity of Germany were more apparent in Hamburg than elsewhere, partly because I had unusual opportunities to observe that great port. In describing what I saw there, the awakening that is going on all over Germany, the patient methods, the intelligent study applied to mechanical pursuits, are also described.

Forty years ago Germany was a country full of educated men who hitherto had been provided with no practical objects to which their study could be applied and who reasoned and philosophized. But with the awakening that then took place, a fair field for practical work was offered these advanced students, and the results are apparent in every branch where knowledge and science, where chemistry, geology, mechanics and physics can be applied to industry. With all the rest of Germany, Hamburg felt the new influences and lent herself wholeheartedly to maritime affairs. The story of her advance is much like that which could be told of many another German city.

"The World is my Field"; that is the ambitious motto that is carved over the doors of the palace which the Hamburg-American Line calls its home. The words sound like Mr. Garrison's, "My country is the world," but the feeling that underlies them is less altruistic. The steamship company has, however, gone far to make good its motto, and a visit to its docks is a memorable experience. Ships and goods from every clime crowd its docks and warehouses, and yet the business is only a fraction, though a large one, of what goes on in the port.

I cannot here write a history of the growth of Hamburg's commerce, but it is told quite well in the masonry of its docks. Most hospitably I was offered a launch by the Hamburg-American Line, and with an official of that company made the tour of the docks, and this is what we saw: First, we threaded our way between long rows of many-storied brick warehouses, among the lighters piled with goods in transfer between ship and warehouse. (Plate 19.) The storage warehouses are built by private stock companies and paid for by them, they receiving a ground lease for a long period from the State of Hamburg. The warehouses are said to pay a good interest to their stockholders. They were built in 1882 to 1888 and are several stories high, and storage for any continued period is all done in this district, the goods being brought in lighters or otherwise. I am told that a part of the income from the warehouses goes to the Dock Administration and is invested in Warehouse Company stock, so that, after a time, the municipality may own the warehouses. On the outer side of these warehouses ran the railroad tracks and the streets, and in the midst of them is the electric power-house.

We next sailed through the long series of docks. Forty years ago the Elbe had half its present depth, and the shipping at Hamburg was cared for at ordinary river piers. The first docks were built in 1866 and additions have been made to their number and size about once in five years ever since. The earlier docks are by modern ideas narrow and shallow, and the sheds and quays are too short. The new sheds are of one story only and are of about two ship lengths, say 1,200 feet, and the quays are about 180 feet from curb to curb. Each shed will take the entire cargo from the adjoining ship. The quay walls are of concrete on piling. The sheds are divided by walls, and the new ones are closed by sliding doors towards the ships. They are not

fireproof, but of wood covered with galvanized iron. They are carried by steel columns running from the piles to the roof. The columns are enclosed in concrete from the piles to the street level. (Plate 18 and 23.)

Goods delivered into the sheds at the new docks are either sent inland at once by land or water, or transferred at once to ships going elsewhere, or they are lightered to the warehouses and stored in bond until wanted for export use, or they are manufactured within the free port and then sent either to a foreign port free of duty, or inland on paying duty.

The petroleum dock, which originally was distant from others, is now nearer the centre. It is to be removed to a remote distance. The Hamburg Line have already removed their docks to get more water for the large modern vessels. The normal tide is about two meters. The greatest tide is about three meters, and steps at the landings are made to meet this unusual contingency. Throughout the port are scattered pile piers, isolated in the water. Ships can tie up to these and load and unload freight and coal from lighters, and escape all expenses of quays or sheds. (Plates 15 and 16.)

As we passed on through dock after dock they grew larger and larger. They had all been dug out of the solid fields and then later opened to the tide and the river. There are no gates or locks except at one place and that exists only to turn the flow of the river so that it will continue to scour the channel. In one dock lie barges and canal boats; in another all the petroleum business; in others sailing ships; in others steamers. (Plates 19, 20 and 21.) All the endless long walls were bordered on each water side by long sheds. The street and railway runs between the sheds, and on the water side of the sheds are countless electric and hydraulic cranes which travel (one wheel on the ground rail and one near the eaves of the shed) to where the presence of ships makes them needed. Lightering seems a necessity, and there is a vast and active movement of lighters between ships and docks. Our hospitable guide suggested that in new docks time would be saved if a canal for the lighters could go down in or between the sheds so that the front of the quays would always be free for large vessels and not be occupied by small lighters. In the sheds the cargoes ready for shipment or just discharged are laid out in neat, orderly rows, with ample room for inspection — marked for Penang and Cherubusco, for Sagua la Grande and St. Petersburg, for Paramaribo and Boston (packages of salted fish for Boston, if you please), and the ships were destined for as varied and as strange ports.

So, after passing through many docks and by countless vessels, by the floating dock that takes an 18,000 ton vessel, and another building for 14,000 tons, we came to the great ship-building works of Bloem & Voss. These were fitted with massive cranes and huge steel scaffoldings within which a great ship was to grow and on which the materials for its structure were speedily moved by travelling cranes. (Plate 22.) Near them new yards are in course of preparation for the Vulcan Works, which are soon to be moved from Stettin to Hamburg.

Then we visited the faultless plant of the Hamburg-American Line — docks, warehouses, railways, power cranes (145 of them, I believe, used by the Hamburg-American Company alone), and neatly paved streets; an artesian well and reservoir to serve all the liners with pure water; a disinfecting plant; a great electric plant to furnish light and to provide power for the cranes; repair shops for all kinds of work; storehouses for galvanized iron beds, and for mattresses, boats and rigging; silver-plating shop where knives and forks are renovated; restaurants where for a penny or two the men get their hot coffee and tea, 7,000 bottles a day, and the bread and the lunch they may not bring with them into the free port; and a whole village for the accommodation of emigrants. Beyond this company's domains more docks are being dug out of the fields to be later joined to the river and this vast system.

I have, however, scarcely mentioned the free port, though it greatly interested me. Perhaps two thirds of all that I have described, including the Hamburg-American docks, as well as others, and the ship-building plant and an island covered with manufacturing establish-

ments, is all surrounded by a high wall which, where it divides off the open water of the port, becomes a high pile barricade. (Plate 19.) At the opening in this water barricade or at the land gates are the stations of the customs officers, and as people or boats or vessels go in or out they are hailed and have to account for themselves. All goods may enter this enclosure free of duty and go out free also after manufacture or otherwise provided they are exported; but if they enter Hamburg or German country they are liable to the usual duties. A good deal of manufacturing is done on the island, but not as much as I should have anticipated. Land on which to build factories within the free port is leased by the city for the purpose at two marks per square meter per year. The methods by which the free port was conducted seemed to me so simple that, as I have said elsewhere in these papers, I thought they might easily be adopted in the United States.

I have mentioned above that the warehouses were built by private companies on land prepared by and leased by the State of Hamburg. The State of Hamburg assisted by the Government also owns, builds and equips the docks and piers with their cranes, machinery, electric plants and boilers, and holds some of them free for the use of the smaller steamship lines and "tramp" steamers, who also may have the use of the sheds. The State leases others to established lines. The Hamburg-American docks and sheds were thus built for that company under an agreement by which they pay three and one-half per cent on the cost of the docks and sheds.

The city now has in contemplation not only more docks but an immense landing stage, with waiting rooms and other conveniences, to stretch along the river front. Here all liners can land or receive their passengers before proceeding to the docks or the ocean, much as is now done at Liverpool, except that the Hamburg scheme is more ambitious and includes a long and handsome building for offices and conveniences for the passengers.

The prosperity which has come to this progressive port shows itself in the city behind it, which has fine public buildings and fine boulevards partly on the site of demolished fortifications. Much of its best residence quarter lies about the Alster basins and as these much resemble the basin we are constructing in Boston, they were an especial object of interest to me. The most important part of the town is at the head of these basins. The great hotels face it and the City Hall is close by. The shores in general are treated with banks and foliage and coves and overhanging trees, but at their very head, in front of the hotels, is a terraced architectural landing, where all day long, and far into the night, little steamers carry excursionists or people bound for the remote borders of the basins, just as they will shortly be doing in our Charles River Basin. The burning of soft coal is prohibited on these waters, so that the steamers are not on that account objectionable. This regulation might well be applied to the Charles River. Tree-bordered roads encircle both basins, and on the inner side of these are many of the best residences, having a view of the water through and over the trees, but protected by them from glare. As in most European tree-planting, these trees are of moderate height and size. At a distance of a quarter of a mile from the upper esplanade the main through line of railroad crosses the Alster. Instead of being a blemish it has created an agreeable addition to the scene. A promontory carries it out from either shore, and it crosses the intervening water on a bridge of three stone arches. These carry a wide avenue besides the railroad trains, and all these are soon lost behind the trees which droop over the beaches of the promontories. (Plate 24.)

Comparisons are often made between the Binnen Alster, which is about one third of a mile across in each direction, and our basin. For instance, it has been said that if an island were constructed in the basin from a bridge at Deerfield Street to one at Dartmouth Street "a basin twice the size of the Binnen Alster would remain above the island, and a basin three times the size of the Binnen Alster would remain below the island." I cannot believe but that it would be a loss to Boston if our river had to be so divided that its parts would be no larger than two or three times

that of the Binnen Alster. This may be necessary when the bridges become very frequent, but not for a long time yet. At Hamburg the promontories and bridge rather add to the view, and an island instead would have had much the same effect. Also the contrast in size between the Binnen Alster and the lower Alster basin is agreeable. The latter, being about five eighths of a mile wide and one and one-half miles long, much more nearly resembles what we may have by proper treatment than does the smaller upper basin. They are most admirable points of departure for a study of the finish of our basin. (Plates 24 and 25.)

I did not see the other German ocean ports, but have no doubt that the stories of Stettin and Dantzig and Bremen and Lubeck are much the same as that of Hamburg—stories of the courageous application of science and industry to remedy defects and to take advantage of opportunities.

Before leaving, however, the subject of Germany I should like to speak of one other German river city. At Cologne, which I visited, it seemed to me that the new school of German city builders could find abundant backing for their contention that too much clearing away can be done around an old building. One cannot recognize that the cathedral is vast, so much vaster is the space in which it is set. Only on entering it is the view so framed and confined that one appreciates its size and majesty and splendor.

The modern city builder had a great practical opportunity offered him at Cologne. When the city, taking a new lease of life, extended its boundaries, the plan of the surrounding districts was entrusted to Professor Stübgen. Eighteen years or so have elapsed, and one now sees the completed district. It seemed to me that the result was even better than the theories. There is an agreeable variety in the streets. The main arteries lead to the necessary foci. The incidents are varied and interesting. The old monuments are beautifully framed. On the whole, I thought this "ring" region a very charming modern product of German thought and study. (Plate 26.)

A ride along the river piers also surprises one by the view it presents of a great and active port. The quays continue for a long distance. They are fitted with commodious sheds, and an army of electric or hydraulic cranes transfer goods between the sheds and a fleet of river barges and ocean-going steamers. It is a scene of bustling activity where formerly there were only tourists and an occasional raft of German logs. (Plate 26.)

Berlin is not a maritime city, although its traffic by water is not inconsiderable. Even the casual visitor sees this commerce floating by on the picturesque canals which thread their silent way through the busy city. But though we cannot talk of it as a port, one can hardly talk of Germany without mentioning Berlin, round which everything centers. It is growing like an American city. New districts covered with costly apartment houses and other buildings constantly add to its vast bulk. It is harder to trace any underlying scheme in the plan of the city than it is in Paris. In individual features of plan it somewhat echoes Paris, and you feel the influence of the age of Louis XV., not only in the style of the palaces, but in the scheme of the Linden and the older parts of the city. The features, however, are not so related to each other as they are in Paris, and the whole is so large and bewildering that one finally ceases to search for its general scheme, and has time left to study German taste.

The most beautiful feature of Berlin is the Tiergarten, a great park shaded by fine trees and lying in the midst of the inhabited city; for Berlin and its suburb Charlottenburg are now practically one, so far as the stranger sees. Palatial houses face these dark green groves,

and one can hardly imagine better sites. The Sieges Allée runs through the park. The white marble groups that keep in memory the long line of Hohenzollerns make the green verdure look brighter still. They would be beautiful themselves if there were not such an endless number of them. This lack of the due relation of things and the absence of proper scale seem the fundamental troubles with design as it appears in Berlin. Colossal statues are surrounded by huge Tritons and Nymphs that are not only larger than any ever were made before, but are close to the sidewalk, where you can touch them and compare their vastness with your own insignificance. Classical details, but of new proportions, cover the cathedral and the public buildings. Here and there buildings like the new Art Gallery, with its bridge approaches, or the great museums and other buildings by which Schinkel put his mark on the city, or the early buildings of the city that echo the Paris of Louis XV., bring you back to the world of art. But whether one likes the detail of modern Berlin or not, everyone must admire the grandiose air which its great buildings give to it, and the imposing way in which its avenues and squares and bridges are laid out.

I have described elsewhere in these papers the electric railway of Berlin. It is a model of skilful arrangement and of intelligent design.

We made a most agreeable excursion to Potsdam. The stately chateau set in charming gardens is a reduced Versailles and in some ways as interesting, for (thus supporting the theories of the modern school in city planning) it is not so large but that one can comprehend and enjoy it as he would a fine picture in a suitable frame.

X.

Manchester — Liverpool — London.

The great ports of England differ from those of Germany in that they do not depend in any such great measure on inland, water-borne traffic. Indeed, there are no such vast rivers to serve them as the Elbe and the Rhine and the Danube, nor is there behind them the vast "Hinterland" of Europe. To a great extent the manufacturing towns of England are either on or near the sea, and in this proximity to ocean carriage Mr. Elzbacher sees great advantage. The German manufacturing centres are from 100 to 150 miles distant from the sea. At vast expense they have made the great rivers navigable and thus have gained access to deep water. In Great Britain industries are, as a rule, near the sea and at the utmost 60 miles away. The relation of these industrial centres to ocean traffic is, on a grand scale, the same system that has been adopted at the Bush Stores, in Brooklyn, where owing to the proximity of factories, warehouses and wharves the movement of freight is reduced to a minimum. While Glasgow, Edinburgh, Dundee, Newcastle, Middlesborough, Cardiff, Manchester, London, Belfast and many others can manufacture close to the sea, the German industrial army fights far from its base.

The great English cities that are not on the sea, like Birmingham and Manchester, wish that they were, and a far less sum than Germany has spent on her navigable rivers would give England the modern system of waterways for which she is in every way adapted. This wish to reach the sea was so strong with the Manchester people that it culminated finally in their building the vast canal which has made Manchester an ocean port. It is a monument to

persistence, to energy, and to public spirit. As yet its stockholders get no returns, but Manchester seems full of faith in its future, and if they get no direct dividends it must be a tremendous factor in the prosperity of the city.

Manchester became sensible of the need of a canal because she found herself dependent for her import and export trade on the rival city of Liverpool. It was urged that "a ship canal to Manchester would be a profitable investment, should it secure but a portion only of the natural increment of the trade for which Liverpool during the ensuing decade would probably have to provide at great cost and without any mitigation to the Lancashire industries of the existing excessive railway and dock charges." The high charges in Liverpool, which Manchester found onerous, were partly due to the want of facilities for distribution. Liverpool, often largely profiting from this cause, it was said, took little pains to remove it. The then existing railway rates were thought to have disastrous effects, and a statement was quoted from Mr. Moore, chairman of the London & Northwestern Railway Company, that "the sea and canals do more to bring down railway rates than any competition among the railways themselves." Hence it was argued that in the development of the inland waterways the public had the most powerful lever for the reduction of railway charges.

The first bill regarding the canal was passed by the House of Commons Committee July 6, 1883. The canal was open to traffic Jan. 1, 1894. It is $35\frac{1}{2}$ miles long, and up to January, 1898, had cost £15,182,670. The deepest cutting is 66 feet, and there is another 55 deep, chiefly through rock, a mile and a half long. The difference of level between Runcorn and Manchester is 60 feet 6 inches. There are five locks. The Bridgewater Canal is carried over the canal and on the passage of large ships a section of it is swung around. Two railways cross the canal on high level viaducts. There are coal basins to receive coal from South Yorkshire, Cheshire, the Midlands and Lancashire. Docks, quays, warehouses, sheds, roads, grain elevators, hydraulic cranes, railways, are all provided at Manchester, and subways to carry the pipes for the hydraulic service and fresh water supply are built around the docks just behind the coping. Trains are made up at the docks and conveyed by the Ship Canal Company's locomotives to the limits of the estate, and there transferred to the railway companies. The dock water area is $104\frac{1}{2}$ acres; the quay area, 152 acres; $5\frac{1}{8}$ miles is the total length of the quays, and 9,680 lineal yards the total quay frontage. The dry-docks and pontoon company occupy seventeen acres, with a canal frontage of 1,500 feet, and all conveniences for ship repairing. There is an abundant supply of water to feed the canal. It is dark in color, but free from bad odor, and the steps taken to improve it may prove the salvation of the neighboring rivers, as well as of the industries along their banks. As the canal is virtually a series of long, narrow docks, by widening it vessels may be enabled to lie at any point without interfering with passing traffic.

The visitor to Liverpool can inspect its docks (Plate 27) casually, but with ease, from the elevated railway, which runs by them for their whole extent. It is a very grand spectacle. The docks are all enclosed by tide gates and it seems as if vessels would find the entrance slow and tortuous. The necessity for tide gates and basins at all seems a misfortune, but the docks increase the area of the floating surfaces of the harbor and the length of its quays; the excavations are less deep if the docks are gated than they would need to be to bear great ships at low tide; and once inside the gates, vessels wholly escape the inconvenience of rising and falling with the tide.

In a rapid journey around the docks the absence of freight cars was very noticeable, although a track for them runs beneath the elevated road along the head of the quays. I asked

if the cars were run at night, and was told no, but if I waited long enough I should see some pass. I was interested afterwards to read that another grievance of the Manchester people was, that though there were some railroads around the docks they were not generally used for the transport of merchandise, and that cartage, whether performed or not, was charged for. The docks were liberally supplied with cranes, many of which travelled on the roofs of the sheds (Plate No. 28), but I remembered the neatness and activity of Hamburg, and in spite of the tremendous size of Liverpool's docks I looked at them in a superior way, as if I had seen something better.

Prof. Ramsay Muir, in his new "History of Liverpool," gives a history of the rise of that port. I regret that it is rather long to quote here in full, but from it we can gather a few notes. Through the middle of the nineteenth century England held the commercial monopoly which she had gained during the Napoleonic wars. Until about 1870 Europe was perplexed with political troubles and the United States was occupied by the Civil War and the development of the West. During this time Liverpool, as the distributing centre for England's industrial district, profited greatly by England's supreme industrial and commercial power. Still more, when free trade was adopted, the removal of barriers to the trade flowing to England magnified her prosperity. During the latter part of the nineteenth century Europe was quiet and the United States came to a knowledge of her strength. High tariffs were adopted in other countries and other nations built up merchant marine, but even during this period the addition to the tonnage of Liverpool was more than twice as great as the actual addition made during the period of unquestioned ascendancy. Now, Liverpool conducts one third of the export and one fourth of the import trade of the United Kingdom and owns one third of the shipping of the kingdom and one seventh of the total registered shipping of the world. Of every ten ships that go to and fro on all the seas of all the world, one hails from Liverpool, and she has become especially the home of "liners" sailing to all parts of the globe on fixed and regular days of sailing. As these liners represent a great investment of capital and as their day of service is soon over, they must be made to earn with the greatest possible swiftness. This need of the utmost despatch in the handling of cargo and in supplying it and in refitting has led to "the enlargement and perfecting of the dock system until it has no rival anywhere in the world." This great enterprise is entrusted to a Board directly elected in part by those who most use the docks, and it has come to be an honor for the principal merchants of the port to be allowed to give their time and labor to the direction of these vast interests.

The dock area reaches to five hundred and seventy acres. There are thirty-five miles of lineal quay walls. The docks extend for seven miles and a quarter on the Lancashire side of the river alone.

Prof. Ramsay Muir says further:—

"It is in a confluence of great movements that we find the explanation of the stupendous development of Liverpool during the period from 1760 to 1835. The invention of machinery for the textile industries; the use of coal for the smelting of iron; the application of steam to machines; the concentration of most of the great English industries within a radius of a hundred miles from the Mersey; the opening of the markets of India and Spanish America; the vast and rapid growth of America; the concentration of its principal trade in the great port of New York; the opening up of the whole of England, as never before, by means first of roads and canals and later of railways—these are the secrets of the majestic progress of Liverpool; and watching her growth we seem to feel the pulse of England as she passed through the greatest social and economic transformation of which her history has any record."

The great canal at Manchester and the docks at Liverpool were what interested me in those cities. In such tremendous human hives there must be vast activities at work. Doubtless, problems of transportation and of municipal improvement are being solved there that would

be of great interest to us. They are, however, bewildering in their noise and rush, and they are so enveloped in a grey pall of damp, sooty air, that one's only wish is to escape from them as places unfit for human habitation. The one municipal improvement that would outweigh all others in these cities would be the abolition of the smoke nuisance.

England has not learned that which is familiar to American mechanical circles and which teaches the necessity of constantly exchanging old machinery, though not worn out, for that of the latest type. She clings to old machines and old patterns. But in harbor construction the reverse is now nearly true. America tries to get on with old wharves and warehouses and England improves her harbor facilities and keeps them up to latest standards. All around England harbors have been manufactured out of what were originally tidal estuaries running in from the sea and penetrating the island more or less deeply.

A Glasgow writer says:—

"Our little trickling Clyde was crossed by means of stepping stones only one hundred and twenty years ago. We did not think our tonnage worth recording until 1831, when it stood at 732,327; revenue, £18,392; but fifty years later it had grown to more than 3,000,000 tons, producing a trifle over £240,000 per year, and the population had grown also from 203,000 to 609,000. We owe all this to our navigation, without which our turnover would never have got beyond a few salmon."

A Newcastle man says:—

"In the old times we were paddling in 6 feet of water where we now have a depth of 22 feet at low tide, with a greatly increased width, gained by removing some 70,000,000 tons of obstructive material from the river bed, cutting off promontories and exploding a rocky cliff—Bell Point—that formerly stood 72 feet above high water and extended 450 feet into the stream. And all this—together with the removal of a bar which secured a low water depth of more than 20 feet instead of 6½— all the result of private enterprise and local determination."

Middlesborough, also, since 1855, has built at least 20 miles of walls and cleared 2,000,000 tons of gravel and clay from its channel; the waterway is 200 feet wide at Stockton and 500 feet wide at Middlesborough. In 1863, the depth was 3 feet 6 inches; now it is 20 feet. At one point 120,000 cubic yards of rock had to be broken up to a depth of 16½ feet and removed from the course. Two thousand six hundred acres of land had been thus reclaimed and about half of it sold.

All around England, then, there is active competition in transportation matters. Small and great towns vie with each other in municipal improvements, but still all the life-blood of the United Kingdom ebbs and flows from the central heart of London. Every time that I return to London it seems to me more interesting—the most interesting city in the world—and in some ways one might almost say the most beautiful. Our windows commanded the view of the Thames from where the dome of St. Paul's rises grandly above the roofs and steeples of the old city to where the towers of Westminster show faint outlines on a misty morning or silhouette their graceful forms against a sunset sky. Beneath ran the splendid embankment that has done so much to beautify London, and beyond ebbed and flowed the mighty river, bearing to and fro with the tide the commerce-laden barges and red-sailed lighters, and spanned by great bridges over which a torrent of humanity was constantly flowing. There is no grander picture to be found in any city and it is worth the journey there to enjoy that alone.

From there it is a long cry to Blackwall and the docks. I made the trip with the keenest interest, but could not study the docks in detail. In fact, the last and finest dock I saw only at

a distance. One finds it an impossible undertaking. It is too vast and too bewildering, and one gets enough from what can be seen from the railway, which runs on a high viaduct, and from the river boats, which pass the water front of the docks. This sort of view left a general impression on my mind of being un-coördinated, and compared with the German systematic arrangements they seemed individual and old and dirty. All this is natural, because many of them are old and nothing is very clean in London. (Plate 27.) But London itself is well aware that the machine is not up to date, and methods of meeting the changed conditions in the shipping world-trade of London and of providing better navigation facilities and more economical distribution of goods are widely discussed. There have been several committees on the subject in the House of Commons from 1870 until now, culminating in an exhaustive and full report of the Royal Commission on the port of London, 1902, and since that report still a new proposal has become prominent in the shape of the barrage proposal.

The state and tendency of the trade of the port and its changes are well stated by the Royal Commission.

"The port of London is still, as it has been for at least 200 years, the greatest in the world in respect of the amount of shipping and of goods which enter it. Statistics show a constant growth in the volume of trade, although the rate of increase has not been so rapid in the more recent years as it was in some former times. Its trade has grown in tonnage of vessels entering the port from 6 millions, in 1860, to 15½ millions, in 1899, and in the value of goods imported, from 124 millions, in 1872, to 164 millions, in 1899, the exports in the latter year amounting to 88 millions, and its re-exports of foreign goods to 34½ millions. There is no doubt that the bulk of the imports entering the port are consumed or used by the vast population immediately surrounding it, and that the growth of the trade of the port in recent years is chiefly due to the increase in the numbers and wealth of the inhabitants of London and its environs.

"The existence upon the Thames of the greatest market and centre of consumption in the world has, it is contended, bestowed upon the port a huge practical monopoly. London was sure of a trade of which rivals could not deprive it, and, in consequence, had not the usual incentives to effect improvements. Other ports, in keen competition with each other for the general world-trade, have improved their organization and physical advantages in recent years, while London has, in these respects, remained much more nearly stationary. Hence, it is suggested, both the inland and re-export trade of London may have lost ground, relatively to other ports, in consequence of the improvements in other maritime cities of the United Kingdom and in adjacent countries. So far as relates to the re-export of foreign and colonial produce the figures seem, to some extent, to correspond with this view.

"Formerly London was a distributing and collecting port, as being the world's trade focus, the world's market. The cargoes came to the biggest market. The Low Countries and the Continent bought in London and sent goods to London for shipment. London was the 'goods exchange' for Europe to a large extent. Foreign produce formerly was largely a prohibitive luxury, only available to the few. Foreign ports had no use for shiploads; they wanted parcels; shiploads came to London. The development of production, cheapening of transport, abolition of duties, increase of population, spread of wealth, and the introduction of steam factories, altered the situation. The Continent became able to swallow whole shiploads; but continental ports being undeveloped and unhandy, and the force of ancient usage being very strong, cargoes continued to come to London. In 1863 the abolition of the Scheldt dues threw open Antwerp, which at once began to compete with London. The Suez Canal was opened, trade increased enormously, and the ships began to be ordered, with full cargoes, to Antwerp. The new departure extended to Hamburg, Rotterdam, Havre, and other places, and all these ports began competing furiously with one another and all with London. Moreover, the practically new ports of Marseilles, Genoa, and Trieste now intercept cargo which formerly passed through the Straits of

Dover, and these ports are greatly developing. This competition, powerful as it is, is still in its infancy. Continental ports are spending lavishly on improvements, and already British ship-owners prefer Antwerp to London, and would as soon go even to Hamburg as to London. It seems inevitable that the business of London as a port of distribution will decline."

No wonder that, recognizing this to be the condition of London, the Royal Commission made extended suggestions for its relief. During the discussion many alternative schemes were offered, such as:—

- A. Deep water wharves at Gravesend, objected to as on the wrong side of the river and too far from London markets.
- B. Extension of deep water docks like those at Tilbury, objected to as expensive and distant from London markets.
- C. Jetties along the river front, objected to because of the difficulty of mooring and loading and discharging steamers in a rising and falling tideway and because of the obstruction offered to the navigable channel.
- D. Dockization of parts of the river, for instance, forming the river bend at the Isle of Dogs into a great dock, while the tidal river is made to run in a new channel straight through the Isle of Dogs, objected to because of its great cost.
- E. A deep water basin below Gravesend, objected to because of its cost and its distance from London.

I have mentioned these in detail, as it is interesting to see what men suggest when such improvements are in consideration. A plan, however, which has lately come to the front seems more interesting than any yet suggested. Roughly speaking, it is proposed to build a barrage across the Thames in the neighborhood of Gravesend, thus converting the whole lower river into a fresh water lake. Many conflicting interests would have to be dealt with before construction could really take place. The present dock owners would see their capital vanish. The lightermen, who drift up and down the Thames with the tide, may think their business endangered. Still, some could be taken in as partners and work found for the others, and the advantages of the plan are too evident to need pointing out. In upland and non-tidal rivers, damming as a means of obtaining a permanent navigable depth is very common, and the only difference between the barrage and those dams to which people are accustomed on other parts of the river is that it will be in its lower instead of its upper reaches. Curiously enough, I saw no reference in the discussions to Amsterdam, which has formed a tideless port in almost the same manner, but Bostonians will be interested to learn that the report by the Charles River Basin Commission is very highly praised and quoted at great length by the barrage advocates.

Anyone who, like myself, was familiar with London in the later sixties recognizes to-day what a vast amount of study and cost has been spent on municipal improvement. At that time all progress was paralyzed because of a lack of concerted action between the many small towns, self-governed, which together were called London. In 1855 the Metropolitan Board of Works was established and the improvements which they conducted from then until 1889 were continued until now by the London County Councils which was then established. After the great fire of London Sir Christopher Wren made a broad and admirable plan for rebuilding the thoroughfares of the old city, but private interests prevented its being carried out and the streets remained narrow and tortuous and the Thames inaccessible and dirty until powers were combined under the Board of Works. Since then the vast improvements that we know have followed,—improvements from Wapping and Woolwich to Chelsea, and from Peckham and Southwark to Highgate. Northumberland Avenue opened Charing Cross to the Thames, and then followed Shaftesbury Avenue and Charing Cross Road and Gray's Inn Road and the Holborn Viaduct, and thoroughfares through Southwark on the south of the Thames and very many others. Then Queen

Victoria Street and three and a half miles of superb Thames embankment, partly reclaimed from the river, made the way clear from the Houses of Parliament to the Mansion House. Incidentally it gave a site for a low level sewer and made one of the most beautiful thoroughfares in the world. Lately, the King's Way (with a transit subway under it, as well as the usual tunnel for pipes and sewers) has opened up the Strand to Holborn, and to-day a superb mall, a rival of the Champs Elysées, is being constructed from Charing Cross to Buckingham Palace, with radial avenues from the monument in front of the palace conducting to Hyde Park Corner and other entrances to the park. Still, London is not satisfied. Its streets are congested and an army of police are employed to direct and control their crowded traffic. The matter has been the subject of a Parliamentary inquiry and the testimony regarding it fills twelve huge printed volumes. The final report was written by three engineers, and architects loudly object that no consideration has been given to the beauty of the city or its ancient monuments; so, individually, men like Mr. Paul Waterhouse have made exhaustive studies with a view to bettering the results gained from the twelve volumes of testimony, and now the Royal Institute of British Architects has appointed a committee to pursue the same subjects. I was interested to see in their hands a copy of the report by the Boston Society of Architects on the improvement of Boston, and to hear them commend its aims and methods as worthy of a certain imitation in their greater field.

Two things in all these gigantic operations may well interest us. The authorities that take land for these improvements are able to take the entire property where any portion is affected, rearrange what they do not need, and dispose of it after the street is built. Somewhat similar powers, but to a limited extent, are now possible in Massachusetts. They involve a greater investment in the first instance, but whatever gain accrues goes to diminish the final cost of the undertaking. In the case of Northumberland Avenue the buildings destroyed were not valuable, and the estates, when the street was finished, sold readily, so that there was an actual profit on the undertaking of £119,819. In general, however, the undertakings in London seem to have recouped from the sales about half of the original outlay.

Again, when the operations involve the destruction of dwellings, and more than a certain number of laboring people are displaced from their homes, it becomes the duty of the Board of Works or County Council in charge to find or build the necessary homes for these people. In short, they must rehouse them, and this has been a difficult addition to their labors.

By such erratic methods London is being transformed from an inchoate and intricate city into one of much grandeur. The very variety and irregularity of the structures that line these superb streets give an interest to them of quite a different kind from that which one takes in the elegant and formal, but sometimes monotonous, government-directed streets of Paris, no matter how splendid the vistas or how fine the monuments that close them. But to-day London is also really beautiful, the fitly magnificent capital of England.

XI.

Paris.

In the time of Napoleon III., much was said as to the possibility of making Paris a *port de mer*. Indeed, several schemes for this project have been carefully studied by engineers, and one rather wonders that one or another of them has not been realized. Still, even under present circumstances, the Seine has a depth of 10½ feet, and barges of 800 to 1,000 tons reach Paris,

carrying several million tons of merchandise annually. One sees little of either them or of freight trains, but many cargoes are transferred at Rouen to river barges, and others come from Havre and elsewhere, so that the tows and the boats pulled up the Seine by an endless chain carry a large traffic.

The real maritime ports of France are favorably placed as regards great cities and long rivers, and fitted by the government with docks and quays, and yet they make a very poor showing as compared with the ports of Germany and England. Havre, for instance, has a series of fine modern docks, supplied with railroad branches, machinery and everything that a benevolent government finds needful for a modern port. She has a favorable ocean position and should be the port not only of the great city of Paris, but of the vast country that lies back of her in France and far back again of that. Instead of that, she has substantially the commerce of Hull, which hardly is considered a commercial centre. I heard of goods manufactured in Roubaix which used to find their natural outlet for export at Havre, but which lately are sent to Calais or Dieppe and thence to Southampton. The French railroads offered obstacles and the English railroads made it so easy that it pays to export by the latter even with the added cost of breaking bulk when crossing the channel. It would appear, then, that a want of concord between the privately owned railroads or the lack of development in the internal waterways had something to do with the slow advance of France in enlarging her commerce. Her engineers have developed her ports with scientific accuracy—you can consult beautifully engraved maps of them all—from Oran to Dunkerque, but they are not doing what in the modern sense is called a great business. Somehow she does not seize her opportunity and in so far resembles some American ports more than she does the German. Probably the bottom fact is that they have not the push and the go of their northern neighbors; that they do not care for trade and commerce in the whole-hearted way in which the latter apply themselves to it. One is constantly led to think that, as in old times, the North, time after time, set the pace for their more easy-going southern neighbors, so we are to-day seeing a new mastery of the commercial world by northern races. In this contest the conservative and slow-moving Briton, the extravagant and haphazard Americans, and the volatile and light-hearted Gaul must have a care or they will be utterly outstripped by the tireless, scientific, and energetic Germans, every one of whom, from Emperor to schoolboy, is but a cog in the great perfected machine that works for the betterment of the German Empire. These things, after all, do not depend so much on situation or conveniences as on the human creature that is behind them and that controls circumstances.

My interest in visiting seaports therefore waned when I reached France, but I need not say that another kind of interest was thoroughly awakened when I had the privilege of seeing again the monumental development of the city of Paris, even though I had been reading the modern German writers on city planning. Here is work in which the Frenchman does put his heart and soul. The map of Paris still presents more good models of carefully studied detail and of large treatment of great possibilities than any existing city. The destruction of the ancient walls and the creation by that and other means of encircling boulevards—now nearly three rings of them—has given easily understood connection between the great radial lines, and the backbone of the city is grandly marked in its course by the Place de la Nation, the Place de la Bastille, the Place du Palais Royal, the Place de la Concorde and the Arc de l'Etoile. An old fellow may miss the familiar line of the Tuileries and find that in the old time the vistas were more intelligible. The frame around the Place de la Concorde was never too firm. We can feel in sympathy with the German writers if we think it was quite enough to have it open into the Tuileries Gardens without extending that great expanse way into the Court of the Louvre. We may criticize this new building or that grand "Place," but, when all is said and done, where can you find the palatial, the grandiose, the bright and the gay carried out with so much delicacy and refinement as in the plan and the streets of Paris?

As if Paris were not already satisfying the demands of those who seek this sort of beauty, many schemes have of late years been under discussion for improving the city. Among them are the following: —

Subways for pedestrians under the Champs Elysées.

The removal of the great Machinery Building and the formation of a residence quarter around the Champ de Mars.

Opening of the Rue du Louvre northward into the Rue Montmartre.

Extension of the Boulevard Haussmann eastward to intersect the Boulevard Montmartre.

The long-talked-of scheme of levelling the fortifications and making building lots and parks on their site, thus abandoning the present system of *octrois*.

The principal work now in progress is the opening of the Boulevard Raspail, south of the Seine, through blocks that have divided this street into three sections.

Little actual work has been done on new developments in the streets of Paris, as the resources of the city have lately been devoted to the extension of the metropolitan subway system, which will occupy four or five years.

XII.

American Ports.

These sketches of foreign maritime cities demand, for purposes of comparison, a brief note as to the condition of the Atlantic ports of our own country. Nature has provided many of these with the chief necessities, and at others the United States Government has been most liberal in deepening and straightening the channels between them and the ocean. Nearly all the large harbors, such as Galveston, New Orleans, Baltimore, Philadelphia, Norfolk, Boston, Portland and Montreal, now have from 28 to 30 feet of water at mean low tide. Boston is going to have 30 feet on its main channel and 35 feet in its new entrance at low tide. New York already has 40 feet. The fact that the *Mauretania*, when loaded, draws 37 feet 6 inches indicates what modern conditions demand.

The most noticeable change of late years in the commerce of the Atlantic ports is that foreign trade is drifting away from the main Atlantic ports towards those on the southern, western and northern borders. This drift is greater in exports than in imports and arises from the fact that more grain and cotton is exported by the Gulf or Pacific or northern border ports than formerly, and that there is more trade also from the Pacific Coast to the Orient. Regarding imports alone, Boston is the second of American ports, but in exports she stands in the fifth place, being excelled by New York, Galveston, New Orleans and Baltimore, and in that order.

MONTREAL.

The port of Montreal is closed for five months in the year, so that she can hardly expect to rival the leading ports of America in amount of tonnage. Yet placed as she is, one thousand miles from the open sea, she holds in other respects an enviable position as a port well in the interior of the country. As at San Francisco, the whole water front is owned and in the control of the city. Last year it was put in charge of a Board of three Harbor Commissioners. They are building fourteen double-storied steel sheds, each about 500 feet by 96 feet, surmounted by a grain conveyor. They are also planning to build, at a probable cost of \$3,000,000 to \$4,000,000, an elevated track passing alongside the sheds and extending for a total length of 3½ miles along the harbor front. They further intend to have a concrete dry-dock 670 feet long and arranged so that it can be lengthened to 1,000 feet, with 33 feet depth at low water. The channel between Montreal and tide water has been deepened to 30 feet. In the last five years the tonnage of steamers entering the harbor has doubled.

BOSTON.

Boston has so many natural advantages that even without exertion by the city the port must be good. The private enterprise of the railroads and the outlays by the Government have made it more than good. Her deepest channel now gives thirty-five feet of water at low tide, and the tide adds nine feet or so more to that. The port offers many advantages to any single railroad that establishes a terminal on its shores, and the present development of the port is due to what the railroads have done. As these terminals actually exist, however, they are scattered and unrelated to each other. Each railroad owns or leases its own wharves and has little or no relation with those of other lines. The State dock is not at present reached by any railroad whatever and the adjoining State lands are without tenants, although they adjoin admirable harbor frontages. The neighboring New Haven Railroad docks are little used compared with their possibilities, for that railroad is but little concerned with Boston export. The only circuit roads are the Marginal Freight Road, which is on the streets and should be run only at night, and the Grand Junction Road, which has many grade crossings and does not reach South Boston. The coal and lumber wharves, frequented by many large vessels and in other respects excellent, are above Chelsea Bridge. The Hoosac Tunnel docks are not long enough to receive the largest vessels. There is little or no chance for expansion to meet the needs of more or larger ships at any of these sites. On the other hand, in spite of these objections, the port of Boston does a great business. The Mystic docks, which are served by the Boston & Maine and the Fitchburg Railroads, as well as the Albany terminals at East Boston, are the scene of much activity. The sheds are large and full of cargoes; the yards are full of cars; there is also dockage room that meets the present daily demand. Private docks in other parts of the harbor lack patrons, and this is partly due to the fact that the railroads which control the main terminals offer all their great facilities to shippers without extra charge beyond the Trunk Line standing rates for through shipments to Boston. This is a great bid for traffic at this port, and it is not often recognized in discussions on the subject. Perhaps it induces merchants to send goods to Boston. Perhaps another inducement is that Boston has much manufactured freight to return to the interior on cars that have come from the West. At all events, the port has other business besides her picturesque fishing trade and her harbor excursions. Even now she stands second on the list of American importing harbors and fifth as an exporter, and the harbor is so safe and accessible it is sure to go on to greater results.

NEW YORK.

Five eighths of the water frontage of New York City is in charge of the Department of Docks. This consists of three commissioners, who have exclusive control of all the water-front property owned by the city and the general charge and government of the water front not owned by the city. They do not sell, but improve and lease the water front and acquire property from time to time with the intention of finally owning it all.

A pamphlet published in Philadelphia on "Commercial Success" speaks thus of New York: "In 1871, acting under authorization received from the Legislature, the city of New York began the work of acquiring the ownership of its entire water front. From that time to this a steady and systematic progress has been made. The law permits the annual appropriation of a specific sum of money for the purchase of additional dock frontage property, and before many years have passed private ownership there of this class of property will have ceased. The reason for the adoption of this policy was the realization by a number of the leading merchants of New York that under private ownership the wharves, piers, and docks of their city were not likely to be improved in a way to meet the growing demands of commerce, and hence that vessels might go to other American ports which would otherwise come to New York City. If piers were three hundred and fifty feet in length, and it was evident that in a few years more

there would be vessels built needing five hundred feet of wharf room, it was not certain that the private owners of these would extend their docks in anticipation of this demand. To make such an increase in length would involve a large outlay of money. That would be an unqualified fact. The income to be immediately earned upon the added investment would be, on the other hand, a highly problematical factor. The shorter length might for years accommodate nine tenths of the shipping, and it would not pay a private wharf-owner to go to a large expense to meet the demands of such a small fraction of the shipping interest. The private owner of a wharf would consider, as he would be justified in doing, the per cent of interest he could earn upon the capital which he had invested, and not the question of the general welfare of the city and its future as a great commercial centre. Under municipal ownership a broader and more far-reaching view of the situation could be taken. Admitting that the expenditure of hundreds of thousands or possibly millions of dollars in dock improvements was attended for years with only a small direct return, if the expenditure had the indirect result of continuing steamship lines, or of bringing in steamship lines, which might otherwise have found a port elsewhere, the outlay from a public point of view could easily be sustained as a sound business proceeding. As the mayor of the city of New York has recently said in referring to this subject: 'The interest of a private owner is to get the utmost rental out of his property, without regard to the use to which it is put, and no private ownership is large enough in extent to make proper improvements based upon modern ideas of commercial requirements.' It was also felt that public interest required that the largest possible trade should be done at the least possible cost. This end could best be secured by regular, uniform rates; while it was made evident to the municipal authorities that the ocean transportation companies, which were giving employment to a great many laborers, and which were in other ways spending large sums of money in the city, would be likely to increase their facilities and enlarge their demands for labor and supplies, if all of them could be placed upon a similar footing, and could be assured of equality of treatment in the charges or rents paid for doing their business."

Most of the property thus owned by the city is on Manhattan Island. The shores of Jersey and Long Island are lined with docks that are in private hands. Many of the transatlantic lines have their docks on these shores, but even here the city is acquiring land. Inspired by the success of the Bush Terminal Company in South Brooklyn, the Dock Department has come into possession of large frontages on the water in the same neighborhood, where they plan building a series of city piers that it is said may cost \$29,000,000.

The Bush Terminal Estate in South Brooklyn is one of the most interesting recent additions to the port of New York. There are seven piers fitted with modern appliances. Back of these are blocks of warehouses and back of them a railroad yard. Close at hand are blocks of factory buildings fitted with steam and electric power. The Bush Terminal Railroad puts the factories and storehouses in connection with the car-floats, which at stated times connect with the railroad terminals all about the harbor of New York. A manufacturer, who hires space in the factories, delivers his goods at his own elevator to the Bush Company, who do everything further required to send them to their destination. (Plate 12.)

The Hoboken terminal of the North German Lloyd was destroyed by fire in 1900. It has been rebuilt in a modern way. A fireproof bulkhead building runs across the head of three two-story piers. The lower story of the pier sheds is used for freight and is substantially fireproof. The second story is for passengers. Plate No. 35, taken from a steamship folder, shows the construction of these buildings, which are as complete steamship piers as New York has to show. They are not served by a railway. The freight is carried away either by lighters or trucks. Although built for a company which doubtless at home uses travelling cranes on its piers, there seem to be none here. Reliance is placed on cargo tackles which in these buildings are secured in a substantial manner to horizontal, longitudinal box girders on the top of the steel columns, which for this end project about nineteen feet above the eaves.

PHILADELPHIA.

The fact that Philadelphia lies 100 miles or so inland from the ocean is by no means to her disadvantage. Transportation in large freight vessels is cheaper than on freight trains. Hence the farther that vessels can carry ocean freight inland before it is transferred to the railroad the cheaper is the combined movement. Philadelphia has this advantageous position towards the ocean, though with Baltimore she shares the disadvantage of a long journey around the capes of the Delaware. The present railroad differentials go far to help the commerce of both of these cities, and many canals and railroads traverse the very rich country behind Philadelphia and are tributary to her. She is the chief city of one of the richest of Commonwealths, and is herself a centre of manufacturing. She has some 30 miles of deep water front and a channel to the ocean 30 feet deep. In these advantages she is almost the equal of New York.

Philadelphia has a Belt Line Railroad, open to all comers upon equal terms, but for some reason the Philadelphia & Reading is the only company which thus far uses it, the Pennsylvania and the Baltimore & Ohio Railroads having declined to avail of its privileges.

The Philadelphia & Reading has paid the entire cost of all the road constructed, but, in accordance with the terms on which it was started, this Company turned over 51% of the capital stock to the Board of Trade and Commercial Exchange. These bodies are the absolute owners of the stock so transferred, and this insures the independence of the line for all time to come. Thus far the Reading, as the only line using it, pays the cost of maintenance. The other roads can, however, join in its use by paying for a proportionate share of the stock and maintenance. The method of ownership should be noted as an admirable way of obtaining unbiased control.

The port of Philadelphia is controlled by a Board of Port Wardens, supported by the city. The water front, except at the ends of the streets, is privately owned, but the piers are built according to plans and upon sites that are approved by the Board.

CHESAPEAKE BAY.

Norfolk and Newport News are the centres towards which many through lines of railroad lead. The new Tidewater Railroad, now being completed by Mr. H. H. Rogers, runs, with its tributary deep water roads, back 450 miles into the coal and mining fields. Several other roads do much the same. The Southern and Seaboard Air Line roads connect it with the South. The largest and finest shipyard and private dock in the country was established at Newport News by the late Collis Huntington, covering about 150 acres and costing about \$15,000,000. The United States Government has a navy yard and three dry-docks at Norfolk, or rather Portsmouth. Four ocean lines run from Newport News. Many lines of coasting steamers make Norfolk their port, and hundreds of tramp steamers carry raw materials and products hence to all parts of the world. The coal wharves at Norfolk present every evidence of being fitted with modern appliances, but otherwise the port machinery is not noticeable.

Baltimore, like Philadelphia, has the great advantage of an inland position, and, although the city lies far up Chesapeake Bay, a night's sail away from Norfolk, yet she has a deep water channel all the way and along the water front of the town itself. Since the great fire a scheme for a modern wharf system, under municipal ownership, has been in progress in the charge of a bi-partisan commission of four citizens who, with the mayor, constituted the Burnt District Commission. The visitor to Baltimore sees, besides the places made desert by the great fire, a wide clearing away of old buildings along the water front, where are building six piers, each about 200 feet wide, ranging in length from 530 feet to 1,542 feet, and giving a total of 1,003,441 square feet area of piers.

SAVANNAH.

It has been the policy of the city of Savannah to assist railway companies desirous of making that port their terminus. About 1850 the city endorsed the bonds of a railway and took common stock therefor. The road finally became embarrassed and the city lost thereby \$1,000,000; but as the railway was finally absorbed by the Atlantic Coast Line, the general prosperity of the city was greatly increased, for a large amount of trade was brought to the town.

Although during the last ten years several new railways have been built terminating at Savannah, the city has been unwilling to repeat its costly experiment of endorsement. It happened, however, that opposite the city and on the other side of the river lay large rice plantations under irrigation, which, as being deleterious to the health of the town, had been bought by the city and were apparently of little or no value. The promoters of the new railroads saw their value for terminals, and the city authorities sold this land to the new railroad corporations at purely nominal figures, exacting a provision that to make the title absolute they should lay a track from the site to the bridge above the city and construct the bridge and spend \$100,000 on the terminals within two years and a half. All these conditions were fulfilled. A similar trade was carried out on the other side of the city for about 100 acres and another for about 12 acres when the Union Station was organized. All this land was sold at nominal prices. These terminals on Hutchinson's Island are thus owned by the Georgia and Alabama Terminal Company and are leased by them to the Seaboard Air Line Railway, which is now operating them. Together with purchases made on the river front they control 1,200 acres or more. The new railway lines have materially helped the city's prosperity, and enough land has been retained to offer an inducement for other railroads to go to Savannah. It is largely owing to the liberal way in which Savannah has welcomed and encouraged new railroads and new terminals that she now enjoys the distinction of having a water-borne commerce of very large value.

GULF PORTS.

The ports of the Gulf of Mexico have lately advanced greatly in commercial importance. New Orleans is the most important of these ports; and this is natural, for she is at the mouth of a great river that could and ought to bear far more commerce than it does. Meanwhile the railroads follow the river, and among others the Illinois Central has established three great docks and warehouses. There were entered and cleared in the foreign trade in 1905, at New Orleans, 2,244 vessels; at Mobile, 1,419 vessels; at Galveston, 1,015 vessels. The latter port was rebuilt after the great hurricane, and is doing a great business, with many steamship lines making it a centre, including, recently, one that connects it with Christiania in Sweden. Port Arthur, in Texas, at the mouth of the Sabine River, does the business of the Texan oil fields and lumber trade, and must not be forgotten.

XIII.

How Would Germany Develop a Port Like Boston?

Dreaming is not held to be a profitable occupation, but visions have a better reputation; they suggest life and action, and sometimes contain the light of truth.

As I understand the duties of our Commission, we are called upon to see visions; and though we may in the course of our studies become too imaginative, yet that is far better than being inactive. We must map out exactly what we should like in Boston, and, if we

heartily want things of real worth, some way can probably be found to make them realities. If the State or City cannot see them carried to fruition, they can certainly lend aid and strength to private enterprise. The first thing for us to do, therefore, is to decide accurately what we want.

America first made the great discovery that to attain pre-eminence in mechanical processes it is necessary to throw away antiquated tools, even if in good condition, and that the very latest patterns must take their place if one would lead the world's markets. This is to a great degree what the fortunes of Pittsburg have been built upon. There machinery of great cost is exchanged for such as can gain some seconds on each operation. These somewhat extravagant changes and the use of complicated machines may not be as necessary in Europe as in America, for in Germany labor costs four marks a day against four or five dollars in America; in America coal costs a third of what it does in France; and a workman in America can mine three times the coal that a German can, because the coal veins are thicker and nearer the surface. Everybody, however, recognizes in mechanical matters the discovery that was forced upon America, and it is agreed by all that the use of machines that save time and diminish the amount of human labor afford (within the limits that the customs of respective countries permit) the sure road to pre-eminence. This lesson, so well understood in mechanical affairs by Americans, has not been thoroughly applied by them to the development of maritime ports on broad lines and with a view to the welfare of the port and city rather than for the profit of private corporations. The Germans, on the other hand, if they scarcely equal the Americans in the application of machinery to mechanical processes, have applied far more thought and science to the development of their ports in the public interest, and from them Americans have much to learn. Although I recognize fully the inability of an ordinary citizen to understand its full meaning, yet the observation of these matters in foreign cities proved of great interest to me.

I have wondered on my journey what the German Emperor, with his vast authority and influence, would do if there existed on the coast of Germany a port with the natural advantages of Boston Harbor. Nothing resembling it is to be found there, nor indeed is it to be found in Holland, Belgium or France, although in some of these countries vastly larger ports have been artificially developed. Our harbor is close to the open ocean, but offers the best of protection on all sides. It has natural deep-water channels on which the National Government has lavished large sums, rendering them more deep and more straight. The largest ships can now come close to the business city. The fleets of the world could ride safely in its ample and secure roadsteads. There is not a harbor in the world with better natural advantages for a port.

Seeing, then, this wonderful opportunity and recognizing, as he quickly would, that as a maritime city Boston is not abreast with the times, I think the German Kaiser would first consider through what means municipal improvements here are effected. Surely the first thing that would strike his disciplined and orderly German mind as he reviewed Boston would be the incoherence and unnecessary independence of the local governments of the neighborhood of Boston. These are the days of combinations and large affairs, and were our city managed like a department store or a trust company, the absurdity of many existing conditions would be apparent. We recognize the need of united action when we create metropolitan boards for water supply, sewage disposal and parks, but on the same principle the Transit Commission and the Police should be metropolitan, and the system and science which the School Commission have brought to the building of schools should be extended to similar work in the suburbs. There is something amiss, too, when such vast numbers of people pay taxes in some small suburb, pretending that because they sleep there they live there, although during most of their waking hours they are guarded from fire and thieves and supplied with water and pavements and street lights by the city of Boston. The thought that most pursued me everywhere as we whirled in an automobile through Germany, France, and Holland, was how in countries plainly less rich than ours the public works were everywhere of the first order. It

mortified me to see poor countries, where women have to work in the fields and where the struggle for a livelihood is hard, possessing as a matter of course fine public buildings for City and State, and perfect roads over which we travelled so smoothly in the shade of long lines of well-kept trees. It seemed to me that nowhere do people get as little for their money as in America. In Europe it all tells, because more systematic and more businesslike methods are applied to it. Besides, public servants are honest, and you cannot imagine such peculations as those at Harrisburg or San Francisco occurring in the German Empire. By degrees, probably, America will outgrow her present childish and helpless attitude towards public expenditure. She will insist on a more businesslike outlay of funds on public works, and a study of the latter as a whole rather than as unrelated details. We shall then get our money's worth.

I think a German might remark that the government of cities is, in his country, a matter of business and not one of party politics, and that in this lies reason enough for the better results they get from public expenditure. A German burgomaster is often a stranger to the city over which he presides — induced to come and take its business management, just as any bank in the city might invite a financier from another city to be its president because he had done faithful work in his previous post. The burgomaster's business is to increase the town's prosperity and make it more beautiful, healthy, agreeable and comfortable. The Germans even find some advantages in employing an outsider as being free from preconceived ideas or personal considerations. They give him a long enough term to make his mark, and then either retire him on a pension or elect him for a further term at a higher salary.

Perhaps we cannot yet eliminate politics from city management, absurd as such a mingling is, but we can do what is equivalent. Even though the administration of local affairs in the city and in the different suburbs continues in its present form, we might widen the power of existing metropolitan boards and increase them in number and have them cover other and more subjects, and so unite them that they may not act independently and without relation to each other, but take counsel together and act in unanimity for the good of the metropolitan district, which is practically one in purpose and resource.

The Emperor's next note would probably be that Boston has no great tributary river to furnish a free road and cheap carriage for its commerce to and from the country behind it. He would be wise enough to know that our conditions are very different from those in Germany, but remembering how such tributary waters are the foundation of the prosperity of his own native ports, he would, were he well disposed towards us, not drop a subject with which he is so familiar, but would in all probability consider thoroughly whether it would pay to improve the water carriage about Boston. We cannot, in short, study municipal development as Germans would study it without at least considering waterways. Of course, we already enjoy a large water-borne commerce that comes round the capes in coasters and tows. The new Cape Cod Canal is going to make this journey shorter and safer, and hence this commerce may increase. It is not, however, going to develop any commerce which could not at present be carried by water around Cape Cod. It is merely a shorter journey for trade from New York and the South — let us hope even for barges from the Great Lakes, the Erie Canal and the Hudson River. A canal of a more productive sort is one that traverses a manufacturing or agricultural district. In its course business develops and it all is tributary to the port which it serves. Thus considered, a waterway of the nature of the proposed Brockton canal, if it were in existence to-day, would be of far more service to the State than any short cut canal could be. Coal, lumber, bricks and other heavy supplies would go cheaply into the interior of the State and to the manufacturing towns on the borders of the canal, in the original barges, without breaking bulk. The products of the mills and factories would go also without transshipment alongside of the foreign liners at Boston as the nearest shipping port and the nearest to Europe, or be landed at the piers, for distribution in the city.

It may be questioned, however, if a canal were to be built for inland service, whether the one through Brockton would be the most serviceable one possible for the State, or whether it has come to the front because the Brockton people are alive to the importance of the subject. It has an advantage in the fact that it lies in its whole course in the State of Massachusetts, and possibly for that reason it could be handled more easily. Other routes might offer more advantages. Suppose a barrage or dam were built near the mouth of the Neponset River, making the latter a high tide basin. By deepening and canalizing this river through the marshes below Blue Hill, a canal would, with comparatively little cost, reach the high land at Sharon. There locks or a tunnel, or both, would bring large barges through to the comparatively flat country which continues past Mansfield and Attleboro to Pawtucket and Providence. The lake above Sharon might furnish necessary water. The journey to New York would be shorter than by Brockton, the canal would be of about the same length, and it would penetrate more into the centre of the State and permit branches to more places. I am far from saying that such a canal, or indeed that any canal, would be useful or profitable, but it would seem worth a serious thought.

Probably the German Emperor would not be satisfied without studying other schemes also. The trade that comes from the South is for Boston's own use. Comparatively little is coming from far south to Boston for export. Although Boston has lately been exporting southern cotton, yet most southern produce would naturally be trapped on the way by New York. The Cape Cod or the Brockton or the Providence canals will serve local needs, but through commerce, if it ever comes to Boston, will not be southern commerce, but from the West and Northwest. About the year 1825 the completion of the Erie Canal brought the subject of waterways prominently before the people of Massachusetts. It seemed as if they too might benefit from the commerce that was to reach the Hudson by the new route if they could build a canal from Boston to the Hudson and there effect a junction with the Erie and Champlain Canals. Even then this was not a new idea, for in 1791 Gen. Henry Knox had caused surveys to be made for a northern and for a southern canal route from Boston to the Connecticut River, and those drawings are probably still in the possession of the State. Colonel Baldwin's studies submitted to the Legislature of Massachusetts, at their request, between 1825 and 1828, comprised reconnaissances of four different routes to the summit range of high land between Boston Harbor and the Connecticut River, two from thence to the Connecticut, and the same number to the Hudson, as well as several lateral deviations on each line. Some of these contemplated a junction with such existing canals as would have given connection to Providence and Norwich; some involved tunnels at Spencer or Bolton or the Hoosac Mountain. These studies culminated finally in a preference for the route, somewhat like that of the present Fitchburg Railroad, by Westminster and Sterling, or by Ashburnham and Miller's River, to Greenfield on the Connecticut, and thence by the Deerfield River and through the Hoosac Mountain, at much the same place where later the railroad tunnel was built. Thence the journey was easy by the Hoosac River to the Hudson. But these projects were rendered even more interesting by reports made to the United States Government by the Army engineers, stating that a canal along the upper waters of the Connecticut from Lake Memphremagog to a point on the St. Lawrence River, between Montreal and Quebec, was entirely practicable. At the same time, also, the Connecticut River Canal Companies were studying an extension of their work from Springfield northwards. A vision of communication with Canada like that furnished by the Champlain Canal and the Hudson River was alluring, and one reason that the northern route across the State to Greenfield was chosen instead of a southern one to Springfield was that the Connecticut was thus tapped higher up, and Canadian trade coming south by any future Connecticut River canal might thus be lured to Boston instead of going on to Hartford. In making these studies the chief anxiety was to provide water supply for the high levels from a higher level. The tunnel and the height to be overcome were familiar problems even at that time. There are eleven canal tunnels in England

over a mile long. There are many examples now (and many of them I think then existed) of canal tunnels three or four miles long, and of the height of many hundred feet, to be overcome. Many such problems difficult at that day are more easily solved to-day. Where a high-level water supply is lacking water can be pumped; where many locks or flights of locks wasted water, to-day a section of the canal can be formed into a tank, and that, with the vessel in it, can be rolled up an inclined railway or, as in Belgium (Plate 29) and at the Dortmund-Ems Canal, it can be hoisted in a lift. This can be done with comparatively little waste of water. Moreover, whatever water is used for any of these purposes need not now be wasted, but can be transformed as it falls into useful energy in the form of electricity to haul the vessels or to manipulate the machinery. The invention of steam railways and the sudden concentration of men's minds and wealth on the increase of that method of conveyance led to the abandoning of the canal schemes I have described. Besides, in this country, as in England, river and canal improvements seem to have been stifled for selfish purposes by the railroads in order to gain and hold the traffic. From that time onward canals were neglected, as were also the through roads which in the form of turnpikes had proved such profitable investments until the railroad made them almost worthless. But lately we have come to think of State roads as desirable and worthy the attention of a Highway Commission. Perhaps it is worth while to consider whether canals are not worthy of attention.

The chain of Great Lakes forms a wonderful natural waterway, from east to west, across the country, carrying to-day an enormous commerce. At Buffalo it meets not only the Erie Canal, by which, when finished, vessels drawing $11\frac{1}{2}$ feet of water can pass from the lakes to the Atlantic, but also the railroads which are controlled by New York and to which New York is the nearest port. The Kaiser would recall how, when Rotterdam seemed sure of the commerce of the Rhine to the exclusion of German ports, Germany built the Ems-Dortmund Canal and deflected much of the great Westphalian business—the coal of Ruhrort and the steel of Essen—away from Holland and to the North Sea at Emden. She practically built a tributary river and thus made a useful German port of Emden. A waterway of some sort from Boston to the Erie Canal would be of about the same length as the Ems-Dortmund Canal. It might deflect some trade from New York as the German canal deflects it from Rotterdam. It might compel their lowest prices from the railroads that now do the work. It would incidentally develop the State of Massachusetts through its whole length. It would tap the great stream of commerce from the lakes, and might tempt a share of it towards Boston and towards those advantages which Boston will always have over cities possessed of less good harbors, and that are farther from Europe. At first thought such a scheme seems an idle dream, but possibly the Germans, being accustomed to think of canals as useful and possible things, would deem it well to re-study the suggestions of Loammi Baldwin, and while discussing waterways, they might also ask whether a rebuilding of the Middlesex Canal and the canalization of the Merrimac River from Lowell up into New Hampshire might not be a profitable undertaking. In great part the bed of the old canal is still available. It is true that in these days it does not cost much to break bulk in a coal cargo. It is, however, a clear waste of much power when thousands and thousands of tons of coal are dumped in Salem, Newburyport or Charlestown, and are then loaded on cars and carried by rail to Lowell or Manchester at such rate as the railroad corporation can extract. Were it possible to move freight at its destination to and from the barge in which it starts, it is clear that a chance for saving exists over any system that involves breaking bulk. Would not Germany study this subject also thoroughly and not accept the general statement that it costs but little to move coal from barges to trains?

But Boston will surely place her main reliance, not on traffic by inland waterways, but by railroads. In these days the subject of railway connection to the West is widely discussed. The suggestion that great advantages might accrue by having all the railroads of a small district like

New England work in a common interest rather than as rivals would sound familiar to the Emperor. He is accustomed to a State railroad and that is a monopoly; but it is a monopoly managed in the interest of the State, and the Emperor would recognize the need of guarding the public interest of Boston against the possible absolutism of private ownership. Thus guarded, united action by New England might do much not only for local but for through traffic. Of course, we want all the commerce that can be induced to pass New York by and come to us, and all possibilities of western railroad connections are much to be desired, but it is not, after all, for that region that Nature has made us the special port. Ports to the south of us will get most of the Western trade. Were relations between Canada and the United States unrestricted by any international feelings, and if trade took its natural course without any such complications, Boston ought to bear to the Northwest and the great grain fields of Canada the same relation that Rotterdam does to the whole Rhine Valley. Situated in a different country from that which is tributary to it, Boston in its relation to Canada would be again like Dutch Rotterdam in its relation to the German Rhine. Unlike Rotterdam, Boston would not have the water communication with this Hinterland, and, under other circumstances, the trade would follow the St. Lawrence to its mouth; but shallows more and more trouble the port of Montreal, which is discussing every means of restoring her failing harbor, and both Montreal and Quebec, through long seasons, are troubled with ice. On the trans-continental systems that she has built or is now urging to completion, Canada will doubtless prefer to preserve to herself the long haul from ocean to ocean; but with suitably developed railway connections, Boston, if political or national considerations did not intervene, is, at least in winter, the best port for much of this commerce, and she has much freight bound for the West to offer in return. Any railway combination or any interchange of transportation and of trade relations between ourselves and Canada that would aid such a cause are of importance to us. Germany would surely make every endeavor, political and commercial, and by offering cheap service or port facilities, to build up trade relations with Canada and a railway connection to the Northwest. That is one direction in which Boston should search for prosperity.

If Boston were blessed with waterways and through railway connections of her own, there would be no question about the freight that would come and go from it. The next problem would be how to receive and distribute it. When Boston, just before the Southern War, was for that day a great shipping port, she was admirably fitted with the wharves and warehouses then needed. The pile wharves jutting into the harbor were cheap and entirely serviceable. To-day steamship companies with difficulty find nooks in which to stow great liners, and the berths for the different companies are widely separated and bear no special relation to each other. One is served by one railway and another by a different company and exchange between them is difficult or discouraged by the railway companies. Everything is individual and self-contained, as in the scattered basins of the port of London. There is very little machinery to be seen on our Boston piers and nobody seems to understand that it is lacking. There is none of that order and method and space, or that facility of interchange by lighter or rail, which so impresses one in the port of Hamburg. I have watched a load of ore being landed at a Boston dock. There was no machinery for the work but the donkey engine and boom on the mast. Much was done by hand and by two gangs of men, neither of which, I am told, could trespass on the other's work. In Germany, where labor is cheap, they use machinery, but not here, where labor is dear. A German would demand more dock machinery and would say that to make proper use of our port a new or increased scheme of docks must be gradually evolved suited to receive great liners. That is a great undertaking, but in other countries it has been done and to their great advantage. Hamburg, for instance, in 1870, must have had substantially the population and trade of the Boston of that day, but look at the two cities to-day. Antwerp and Bremen and Rotterdam have much the same history. They had the same population

behind them substantially as now, but partly because they set their minds and hearts on accomplishing it, prosperity has poured in upon them. The awakened ambition and courage and character of the people have as much to do with the result as anything.

It is frequently said that the State has already entered upon dock-building, and that its docks lie idle. Hence why build more? It is true enough that they are empty and idle, but it is because the job was only partly done. The trouble with them as docks is primarily that they lack that essential feature of a well-organized port, an open-to-all road connecting them with all trunk lines, nor indeed have they any railroad at all. The adjoining docks belong to a road that has little inducement to bring through goods to Boston; for anything that would come from the West to New York would naturally be exported from that city and not continue through New York to Boston by the New York, New Haven & Hartford Railroad.

One sees the Emperor, therefore, meditating modern dock improvements either at East Boston or at South Boston, or both. If he could ordain an ideal dock system it would be one where, by a system of movable cranes and railroads, it would be possible to take a package from any hatch of any ship and move it to any hatch in any other ship, no matter how far away, or land it on any through freight train that leaves the city. In practice this does not prove possible or worth while. The nearest to it is to have ships of one general character occupy one general neighborhood and what interchange cannot easily be made by the travelling cranes would then be done by lighters, or on occasion the ship moves from one berth to another to take on or leave cargo. Our ideal port should then have its piers long enough to take a whole freight train on them, and on each side one, two or three modern ships. One-story sheds on each side of the piers would extend the full length of the piers, giving opposite each ship a covered space in which its whole out-going and in-coming cargoes can be laid out and prepared for shipment, and on the water side of the sheds would be an army of electric cranes travelling on tracks to where they are needed. A street would run between the piers. Possibly a canal would run in the street or in the sheds, permitting lighters to get opposite the ships and load and unload and not occupy the space that might be in use for large ships. In some portion of the docks the sheds should be replaced by storage warehouses. At the head of the piers, with branches to each pier, will run the circuit freight railway, open to all users of the docks, connecting and serving them all and joining them to all the trunk lines that lead from the city. Above the freight railway would be the elevated passenger railway, and the port would be provided with repair shops and a dry-dock fit to receive the largest steamships, as a city would have an emergency hospital.

Such undertakings (as we have seen earlier in this pamphlet) have been financed in various ways; sometimes by the State or City, or both; sometimes by private corporations, the Government holding the right to buy them at a price at any time; sometimes by private corporations, all later massed together into one body, controlled by a body partly appointed by the State, and partly elected by those who use the docks, and partly by the original builders of the docks. In some of these ways it might happen that Boston could start on these essential improvements of docks and a terminal railroad, but any ideal system would rest on the fact that they are not solely in the control of one of the competing companies. For a perfect scheme the docks and the distributing railroad should both be in some form under the control of city or State to such an extent that no one railroad or steamship line may monopolize the trade of the port. The docks should be on suitable terms accessible to all; to some on long leases, to others for temporary use, and the terminal road should be so independent of railroads that a shipper can choose by what route to send his products.

Of course, in a city with such a settled city front as Boston possesses, the connecting circuit railroad or interchangeable delivery becomes a puzzling matter. The Grand Junction Railroad could be so extended as to form such a complete circuit; or one could be formed by using the

old Watertown Railroad and a bridge to connect it with the Albany Railroad ; or a circuit could be formed as far out as Framingham ; or the connection for freight as well as passengers could be made by tunnel from the basement of the South Station to Charlestown or to the neighborhood of the North Station ; but for an ideal condition this connecting road should be in some way accessible for all lines of railroad without preference, so that goods coming to the city by any through railroad can with ease and despatch reach any ship at any dock, and that delivery from the ships to the railroads can be just as easy.

Another form of connection between the different docks and the railway terminals is possible. Railway floats dispatched at stated times might furnish such communication. This was urged by the State Board in 1897 but has never met with favor in Boston.

One naturally takes it for granted that at least for the present docks will continue to exist on both sides of the harbor. The scheme of a grand series of docks on the south side of South Boston is alluring, and as Boston grows, and perhaps sooner than we now deem possible, the whole region of Old Harbor and Dorchester Bay may come into use for docks. Such an undertaking, however, is possibly a great deal for Boston to experiment with now. The railway connections already referred to would be as good for such a system in the future as any that could be devised. Meanwhile, the State has established good docks at South Boston, which could easily be increased on modern lines, and the railroads have around the harbor fair facilities for the ships that are tributary to their individual lines. The most immediate need, not for any one railroad but for the general prosperity of the port, would seem to be to give intercommunicable railroad connections to all of them of ample dimensions and accessible to all. With such connections the present State docks would probably come into use, and others would be needed. Of course, in the latter event they should be furnished with all the latest appliances, and with every convenience for transshipment, lightering, carting and shipping by rail, and for all this the latest models can be studied at Hamburg and Manchester and in other recently built ports, or with the help of people conversant with those modern ports.

At this point I can imagine that the Kaiser's interest in canals and railways might flag. He might then, to change the subject, observe that although Boston is well supplied with radial streets, yet traffic communication for teaming around or across old Boston, for instance from the North to the South Stations, is circuitous and deficient. There is a lack of such encircling streets as are obtained in foreign cities where the fortifications are replaced by boulevards. Atlantic Avenue is, as far as it goes, an excellent ring road around the piers. The widening of Cross Street, and its continuation to Atlantic Avenue, has also been urged as an additional ring street for the eastern side of the city, and this is a possible solution of the question. Meanwhile Devonshire Street is almost the only direct thoroughfare. To widen it would be very expensive, but every means should be put in play to make it as good a public way as possible. More policemen to direct traffic and restrictions as to teams halting for long periods at the sidewalk would do much to better present conditions.

At present, there is no convenient communication around the western side of the hill, in the direction of South Boston. Carting on the west of Beacon Hill meets with obstructions when it arrives at the large place formed by the junction of Lowell, Merrimac and Causeway Streets, a region not yet built up and easily adapted to new conditions. The city lost a great opportunity when the intentions of the Boston Elevated Railway were defeated and their plan of running straight from this square to the Dam was refused. A great thoroughfare could have been constructed under their tracks, at slight addition to their outlay, straight to this most important focus. This scheme was most unfortunately obstructed, and the railway turned into Lowell Street, which is already a crowded thoroughfare. Now the most obvious method to obtain a passage from this square around the west of Beacon Hill is (as has been heretofore urged) by cutting a broad way from it through blocks of dwellings, past the grounds of the Massachusetts

General Hospital, to a point somewhere near the Jail and the proposed entrance of the subway under Beacon Hill. From such a junction with Cambridge and Charles Streets the journey would be comparatively clear through Charles Street and on to South Boston. A street of this character would improve much dead real estate.

Before abandoning the problem, and as an alternative to wider roads on either the east or the west of Beacon Hill, the Emperor might say that when you cannot go around a hill you may go through it. Beacon Hill begins to rise just south of where Causeway Street forms, with Lowell and Merrimac Streets, a little square. Here, or possibly a little farther on, might enter a broad traffic subway, broad enough for trolley lines and roadways for teams in both directions. This could pass straight on under Beacon Hill and under the new subway which will carry the elevated cars from West Boston Bridge to Park Street, but the puzzle is to find a place for it to emerge without trespassing on the Common and which is in the direction of the South Station, towards which such a tunnel should lead; otherwise a tunnel for carting purposes is not visionary.

At this stage of the studies I think it would be an opportune moment to ask the Emperor if Castle Square did not commend itself to him as a focal point for the rearrangement of Boston. In the first place, it is in a neighborhood where land is inexpensive, but which, from its propinquity to valuable real estate, would become vastly more valuable if proper access were given it. There is much land around it occupied by the poorest buildings, through which streets could travel at slight cost. The roadbeds of the Albany and Providence roads present unbroken stretches that pass through this very spot. I think the Kaiser would accept this as a strategic point, if not for a great public building like a City Hall (for which its central metropolitan position would admirably adapt it), at least for a "rond-point" from which avenues should diverge. This great "Place" would be formed with slight expense by changing the two or three scattered bridges over the railways into one great bridge, or, in other words, the "Place" would be formed over the railways, which would go under it as in a tunnel. From this place already diverge Tremont Street, north and south, and also Castle Street and Warrenton Street. At some day (perhaps when the present land, which is nearly worthless, has become valuable) Arlington Street will also be extended to this "Place," an archway being formed beneath the intervening buildings that front on Boylston Street and which are the only obstacle to this extension. A sketch for this project is to be found in the Society of Architects' pamphlet. I think, moreover, that the Kaiser's autocratic mind would ere this have seen that with proper negotiations the railway in its whole length through this region could be roofed so as to run in a tunnel, and in fact, by widening the tunnel under Castle Street and other streets that are parallel with the railroad, the railway itself could be given more room at the places where it is most pinched. We then should have made to hand, and without any destruction, a fine, wide boulevard encircling the city from practically the spot where Atlantic Avenue has its southern end way around to Cambridge, made on land now free from buildings and in that respect resembling the "Rings" of foreign cities that are made on the sites of ancient encircling fortifications. It would run from the foot of Broadway, the main artery of South Boston, through our new "Place" and on across the present freight yards to near the junction of either Boylston Street or Commonwealth Avenue and Massachusetts Avenue, whence the road is clear and wide, by Harvard Bridge to Cambridge and all that lies beyond. The values arising from the fine new frontages on this great street would probably easily cover its cost. Whenever a new bridge is built across the basin, say opposite Dartmouth Street or Arlington Street, it would lead by any such street directly into this boulevard and so on to more remote places.

The Kaiser might now think he had evolved a real city plan, one involving little destruction; one that gives excellent transit without disturbing the old city; almost a good plan, and yet not quite good. Causeway Street, filled with the elevated road and with the traffic of the North Station and all the freight carting by it, is congested even now and quite unworthy

of the complete "Ring" we have outlined. Besides, what city could be called well cared for that would permit a noble tidal river to be jammed full of piles and turned into a switching and freight yard? The Kaiser would remember that this station was never intended to remain where it is. If there is to be a new or modified North Station, can it not be on the other side of the river where Charles Eliot once suggested it should go? Circumstances are different now and his scheme must be modified. How fine it would be to sweep away all the piling from the river, build a good bridge, and, if the North Station is not eliminated by the operations of the "Merger," place it on the Charlestown side and fronting on an open river basin. It would be reached by surface trolleys on the new bridge or by the elevated trains that cross the Dam and Charlestown bridge. The station thus facing the cleared basin of the lower river, even if of simple construction, would present by the nobility of its site a worthy entrance to the city. If an underground through express service from New York and the South Station is established it would be served by a way station in the centre of the business city and again by the basement of this new North Station. Trains providing for local service would be on the main floor of this station at the level where they now are, and passengers from the higher levels of the elevated roads and bridges and Prison Point Street would enter on a second floor and descend to the trains between the tracks, as is to be the case at the great stations in New York and Cleveland. Boat service, which will soon be established in the completed Charles River Basin, will bring passengers from Watertown and Cambridge and all parts of the Back Bay water front to the dam and (locks or draws permitting) to the broad water steps in front of the station itself, and, as time goes on, another bridge, if built across the Charles to prolong Dartmouth or some neighboring street, would lead traffic straight from the South End to the station. People would complain that such a station is farther from the business centre than the present one, but as the city grows larger they would forget that, and the existence of through trains from the North to the South Stations, with possible way stops, will make this still easier to bear. One obstruction to an improvement of this sort is the presence of Miller's River. That stream is already covered with railroad tracks almost as much as Charles River, and the passage to the basin in the upper part of the stream is tortuous and through a draw in the tracks, and the basin, when I have seen it, contained no boat or vessel. Therefore, it would seem no great engineering feat to adjust this to any new conditions that study may show to be desirable.

These suggestions for the completion of a ring traffic street, the clearing of the river, and a new adjustment of the North Station are not made as if they were ultimate studies. Far from it. They are only intended as an indication of the line of study that Germans would give to such a problem. Of course, if any merit attaches to them as starting points for real study it lies in the fact that though they deal with old Boston and give transit facilities through and around the old city for carting and electric roads and railroads, yet they interfere very little with the existing plan. But when we transfer our attention from the old portion to the outlying portions of the town, the problem is easier than that in the old city. The streets radiating from the city centres outwards are already excellent, but we ought to provide for other concentric rings like those I have mentioned, so that later generations may not find themselves in the same condition that we are in now. I know of no better groundwork from which to begin the study of these outer rings than the sketch in the Report by the Boston Society of Architects, in which two sets of boulevards were outlined mainly from existing streets. The suggestion was that if the routes were established and lines fixed, whenever rebuilding occurred on these thoroughfares it might be made to conform to the new conditions. That report also suggested changes in streets on the Fenway on which no building has yet taken place. When Mr. Olmsted designed the Fenway there was no thought that the city would so soon reach it. As designed, it is an ornamental road to the country, cutting diagonally across the city thoroughfares, and

the waterway almost completely isolates all the land on the west of it from the rest of the city. To enable the city to extend naturally in that direction some breaks through this barrier are plainly needed, and that is what the architects suggested.

Their studies for an island in the Charles River Basin seem in a measure studies of a detail. The island is not a fundamental part of the framework of the city, like the main arteries of transit. There are, however, many reasons advanced for studying it. First, as a real estate venture. Second, as a useful adornment to the basin. The very wide expanses of water would be more serviceable for the pleasure boating, of which the basin is soon to be the scene, if there were more shelter from winds and waves, and the drooping trees and pleasant shores of a not too large island would form a most agreeable addition to the basin view, just as it does at both Alster basins in Hamburg or at the islands in the lakes at The Hague or in the Bois de Boulogne. The third and pressing call for an island will come whenever another bridge is needed. Then it will be apparent to all that however much the present great water expanse is cherished new bridges are going to divide it into uninteresting basins. Then everyone will probably agree on the advantages either of an island breaking the long causeway into two bridges, as the Isle de la Cité does at Paris, or of two wooded promontories leading to a comparatively short bridge in the middle, as is the case between the two Alster basins at Hamburg.

I do not think the Kaiser would call his work about Boston done even if he had accomplished all that I have outlined; even if he had given us good waterway connections to the South and West, and good rail connections to the West and Northwest; even if he had framed a perfect system of cartage and trolley transit around the entire city in concentric rings, and had obtained for us modern docks and connected those by a railway run in the general interest. I have no doubt he would see a vast deal more business going on than now, but he would remark that our export of home manufactures is not what it should be. As a high tariff advocate he would understand what we meant if we told him that the duty on raw materials not produced in America forbids our competing in foreign markets for much that might readily be manufactured here. He would share the sentiment of the "stand-patters" and understand their objection to meddling with methods that appear to have been a source of prosperity here and are having similar results in Germany. Then he might remember that even in Germany, in spite of its high tariff, there exists at Hamburg what they call a "free port." If we termed it not a free port but a "bonded port," why might we not have one here? It is already possible to import raw materials here, pay the duty, and if in manufactured form they are exported within a certain period, a liberal rebate on the customs is made. This is a roundabout and troublesome proceeding. Many years ago the late Austin Corbin projected a bonded port at the end of Long Island, in the interest of the Long Island Railroad Company. The East Boston Company ten years ago planned one for East Boston. In 1906, Mr. T. M. Clark, of Boston, suggested, and Secretary Shaw, speaking in Boston, also referred to, the possibility of establishing bonded ports for manufacturing and export in large cities. Secretary Shaw may have been in jest, and the Boston papers ridiculed him when, as it seems to me, they had better have made the most of such a suggestion from one in authority, but Mr. Clark was not in jest, and after seeing how easily such a plan is administered in Hamburg I certainly believe that we might adopt the system in this country. In fact, it is said to be in operation in a partial way in our Northern border cities, where grain is brought from Canada and milled while under bond and returned as flour to Canada. For some reason it is not taken great advantage of at Hamburg. Perhaps it is because Hamburg has never been a great manufacturing city, like Düsseldorf for example, and its growth in that direction would naturally be slow; but the opportunity might be availed of here, and I cannot see that the protective system would be interfered with in any other way than it now is by the rebates, if raw materials were admitted to these districts custom free to be manufactured in the district and exported from it as manufactured articles. The customs receipts would

in no way lose, and great employment would be given to our citizens. It has been suggested that perhaps the Secretary of the Treasury already has the power to establish such "bonded ports," but, if not, I suggest, therefore, that a law be urged before Congress of the following general purport: —

"Any city in the United States may set apart a 'bonded port,' into which dutiable goods from foreign countries may be received in bond, and from which they, and goods manufactured within the port, may be exported, all without the payment of customs dues — unless either goods or manufactures pass from the port into the United States, in which case they shall be subject to the usual customs.

"Provided, that any city establishing such a port shall build around it such a wall or fence for protection, with gates, and all other details as the United States Treasury Department may ordain, and shall pay annually also to the Treasury Department the actual cost of guarding the bonded port in the interest of the Treasury, and at least the sum of \$25,000 per annum for this purpose, if the cost of this guarding falls below that amount."

Restrictions of the kind named would prevent an indefinite and trifling extension of this work and would confine it to important centres, but would permit it anywhere in the Union, and it would seem to me might greatly encourage export of manufactures, increase opportunities for American industries, and not interfere with existing conditions or questions of free trade or protection. Suppose that such a bill were passed by Congress and that Boston, availing of it, made Thompson's Island or the entrance of Fore River, in Quincy Bay, its bonded port. They could be protected easily. Workmen could live in the neighborhood or go there by trolley or boat. Mr. Clark, writing on March 1, 1907, regarding this subject, says: —

"Suppose the undeveloped portions of East Boston, Chelsea and Everett, and the shores of Fore River, the Neponset, Mystic and Merrimac, to be constituted a free zone for manufacturing export goods from free raw materials, they would soon be crowded with shoe factories, cotton factories, hosiery mills, woolen mills, shirt factories and others, all working on export goods. I am told that American ready-made clothing is so far superior to that made in Europe, that if we could get the materials free we should supply the world. That alone would be an enormous business. I knew a man in New York who had a shirt factory. His average output was fifteen hundred dozen shirts a day. Suppose that multiplied by ten or fifteen and applied to suits of clothes, boots and shoes, underclothes, and a hundred other things as well as shirts, and you can see what a business is virtually offered to Boston, if it has the sense to accept it. No other seaport has so much unoccupied available water front as Boston, exactly suited for bonded port manufacturing, and all would be tributary — doubly so — to the foreign commerce of the city."

This letter presents a picture which in its general features I believe it is entirely possible to realize, with harm to no existing tariff conditions, and with great benefit to the community.

Is it not then possible to accomplish for Boston some of the things I have described? Is it impossible for us to manage our city as we would any corporation in which we had a personal or money interest? Is it impossible to establish such new arteries round the old city as will permit the trade, which is its life-blood, to circulate freely through it? Can we not make our docks modern, and the access to them equal for all? Can we not improve our traffic connections to the West and the Northwest? Can we not clear the forest of piles from the lower river and make the North Station a sightly entrance to the city? May we not hope to see "bonded ports" established? Can we not work towards these ends without a Kaiser? Is it not more possible and more

healthy to enlist the aid of private people and merchants and the steamship and railroad corporations, and depend on their being backed and encouraged by our city and our State? Of course such things are possible. They are crying to be done and the city is full of people who want to help to do them. Boston is not dead or dying. She is a great, prosperous and growing city. A very large business is to-day being carried on in the Mystic River Basin and at Charlestown and East Boston. There are great opportunities for commerce at the neglected and unfinished State dock and on the unfinished lands that belong to the State at South Boston, if only they were reached by the railways. In short, no one denies that by an exercise of autocratic power the disposition of railroads and docks about the port could probably be greatly improved, and so long as that is recognized, there is something to be aimed for, even though our powers are limited. Meanwhile the city is gaining constantly in beauty. People appreciate that after the completion of the great buildings proposed around the Fenway, that neighborhood is going to form a handsome quarter. If those who are troubled about this or that detail in the Charles River Basin would make an excursion around it from Charlestown Bridge to Brookline Bridge, I think they would be greatly encouraged as to the final result of that improvement. Boston can benefit by public criticism, but no advance can be made if we can see nothing but obstacles when new and bold projects are proposed. A careful study of such projects should be followed by united action in a spirit of confidence about our future. We might well take a lesson from our Western cities, where men of all classes and of all degrees of education and wealth work together with enthusiasm for the betterment of their cities. Boston offers a splendid field for such united work on the part of her great organizations and of her influential men. We must first decide what we want and then with proper courage seek the very best for our city.

THE END.

APPENDIX.

APPENDIX No. 1.
STATISTICS OF THE WORLD'S RAILWAYS.

	I. Shareholders.	II. Invested Capital.	III. Average per Share- holder.	IV. Miles of Railway.	V. Average Cost per Mile of Line.
United Kingdom.....	566,460	£ 1,175,001,000	£ 2074	22,634	£ 51,914
United States	327,851	2,752,734,308	8007	214,478	12,868
Germany	State.	662,150,000	..	32,280	20,512
Belgium	"	89,222,500	..	2,846	31,900
Austria Hungary	"	393,497,000	..	22,125	17,785
Holland	"	18,305,975	..	1,809	10,118
British India.....	"	241,574,677	..	27,762	9,061
Canada	"	66,625,000	..	7,750	8,596
South Africa	"	38,652,750	..	3,100	12,468
Australia	"	150,817,000	..	15,075	10,004
Egypt	"	15,000,000	..	1,451	10,338
Average (excluding Great Britain).....				30,710	£14,565

	XII. Number of Merchandise, Mineral and Live Stock Vehicles.	XIII. Average Number of Tons carried per Vehicle per Annum.	XIV. Average per Vehicle per Day.	XV. Total Revenue from all sources in 1904.	XVI. Average Revenue per Mile.
United Kingdom	1,247,601	362	19 cwt.	£ 111,833,000	£ 4,940
United States	1,692,194	774	42 cwt.	411,494,602	1,976
Germany	428,400	604	33 cwt.	99,500,000	3,082
Belgium	73,010	..	..	9,580,475	3,366
Austria Hungary	192,400	..	..	38,950,015	1,760
Holland	16,600	..	..	3,764,825	2,081
British India	206,300	..	..	29,521,533	1,063
Canada	27,930	..	..	9,146,075	1,180
South Africa	14,515	..	..	7,851,500	2,524
Australia	56,065	689	37 cwt.	12,688,475	841
Egypt	7,497	..	..	2,668,296	1,739
Average (excluding Great Britain).....	297,497			£62,516,559	£1,961

	XXIII. Working Expenses per Train Mile.	XXIV. Profit per Train Mile.	XXV. Average Number of Passengers in a Passenger Train.	XXVI. Average Sum received for carrying a Passenger 100 Miles.	XXVIII. Average Sum received for carrying one ton of Goods or Min- erals 100 Miles.
United Kingdom.....	s. D. 3 5½	s. D. 2 2	41	s. D. 8 3	s. D. 9 10
United States	5 0	3 0	50	8 3	3 3
Germany	4 1	2 3	74	4 2	5 7
Belgium	2 9	1 10	81	3 1	..
Austria Hungary	3 8	2 1	63	3 9	5 7
Holland	2 4	1 2	32	5 1	4 9
British India.....	2 4	2 8	217	1 8½	3 9
Canada	5 0	2 11	70	7 4	3 6
South Africa	6 5	2 8	..	..	..
Australia	4 1	1 10	..	..	..
Egypt	3 7	2 11	105	4 3	5 9
Average (excluding Great Britain).....	3 11	2 4	86	4 1	4 6½

**Taken from "Should Our Railways be Nationalized," by W. Cunningham,
Dunfermline, 1906.**

VI. Number of Employees.	VII. Number of Employees per Mile of Line.	VIII. Number of Locomotives.	IX. Number of Locomotives per Mile.	X. Number of Passenger Vehicles.	XI. Number of Passenger Vehicles per Mile.
581,664	26.9	22,443	0.99	70,543	3.12
1,296,121	5.59	46,743	0.21	39,752	0.18
581,000	17.75	20,310	0.62	37,923	1.17
59,766	21.	3,315	1.17	8,100	2.88
..	..	8,300	0.37	16,500	0.74
..	..	967	0.53	2,387	1.31
..	..	10,692	0.38	25,400	0.91
..	..	840	0.11	794	0.10
..	..	846	0.29	1,146	0.37
..	..	2,532	0.17	4,135	0.27
15,000	9.3	465	0.32	700	0.48
645,629	13.9	9,501	0.31	13,683	0.84

XVII. Total Working Expenses.	XVIII. Total Working Expenses per Mile.	XIX. Net Profit for Dividing.	XX. Profit on Invested Capital per cent.	XXI. Average Number of Trains per Day.	XXII. Revenue per Train Mile.
£ 69,173,000	£ 3,055	£ 42,660,000	£ s. d. 3 12 7	48	s. d. 5 7½
261,978,216	1,259	153,270,308	5 14 6	12	8 0
63,051,325	1,985	36,412,678	5 9 10	26	6 4
5,837,370	2,051	3,743,300	4 3 10	41	4 7
25,188,300	1,138	13,766,775	4 5 2	17	5 9
2,462,800	1,914	1,272,025	6 19 0	33	3 6
12,425,050	447	17,096,483	7 1 6	10	5 0
5,850,700	755	3,295,375	4 18 11	8	7 11
5,670,875	1,829	2,160,625	7 2 2	16	9 1
8,605,900	571	4,082,575	2 15 0	8	5 11
1,369,916	973	1,298,376	8 12 1	14	6 6
£39,147,645	£1,288	£36,639,852	£5 14 2½	18	6 3

XXVIII. Average Goods Train Loads.	XXIX. Average Day's Load for a Wagon conveying Goods or Minerals 100 Miles.	XXX. Profit from running a Goods Train 100 Miles.	XXXI. Working Cost of conveying one ton of goods 100 Miles.	XXXII. Profit from conveying one ton of goods 100 Miles.
Tons.	Tons. Cwts.	s. d.	s. d.	s. d.
68	0 15	3 3	5 1	4 9
287	3 1	4 11	1 7	1 8
160	1 5	4 8	2 7	3 0
..
140	1 3	4 3	2 8	2 11
105	1 3	2 10	2 1	2 8
140	3 4	3 0	1 9½	2 0
241	3 5	3 5	2 2	1 4
..
..	..	1 8	..	..
147	2 0	4 10	2 5	3 4
174	2 3	3 8	2 2	2 5



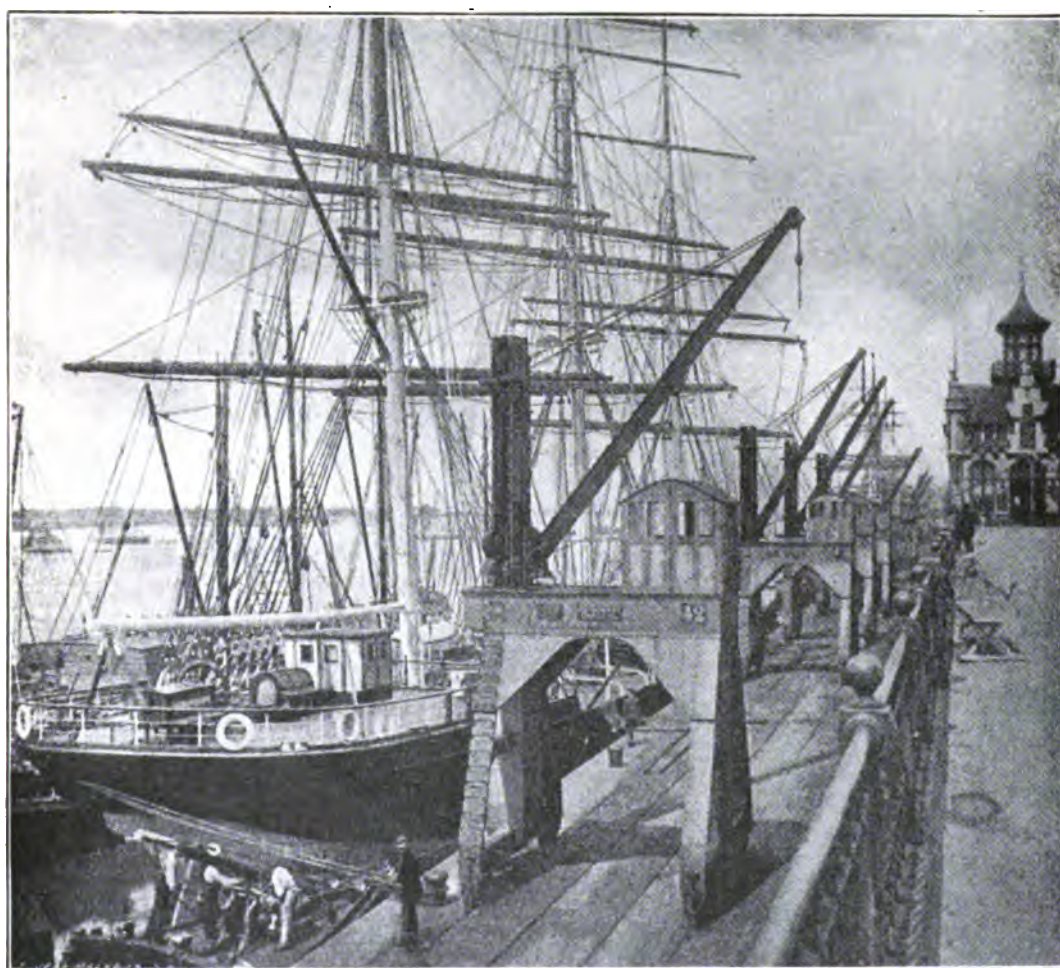
PLATE 1. Outline Map of Germany, showing Position of German Ports and German Rivers.



PLATE 2. Very Elaborate Viaduct, bearing the Railway into the Antwerp Station.



No. 1.

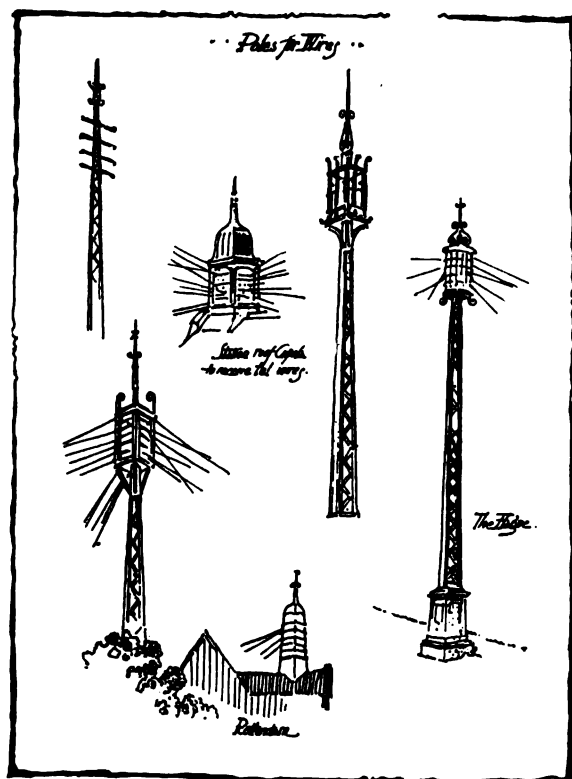


No. 2.

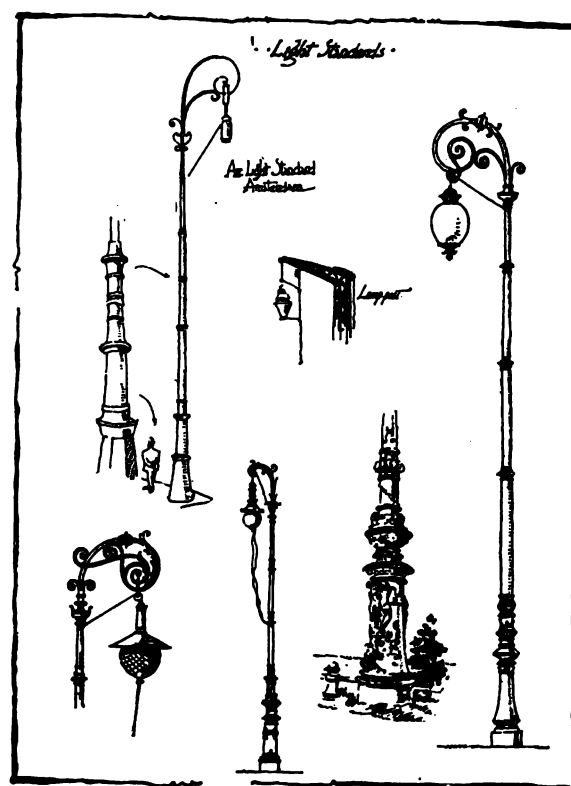
PLATE 3.

No. 1. Antwerp Railway Station. From "La Belgique."

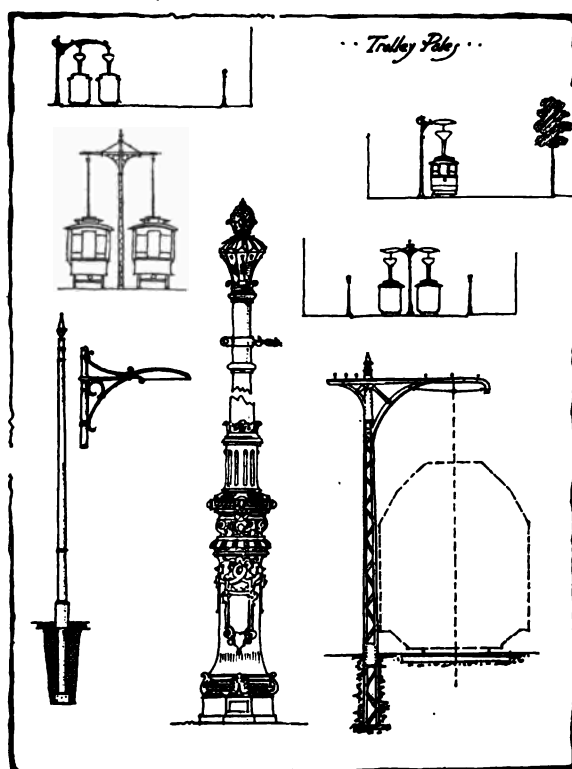
No. 2. Public Promenade (at the right) overlooking the Quay at Antwerp. The freight passes under the Promenade, which is really the roof of the cargo sheds, and the sheds continue on inside of the Promenade. From "La Belgique."



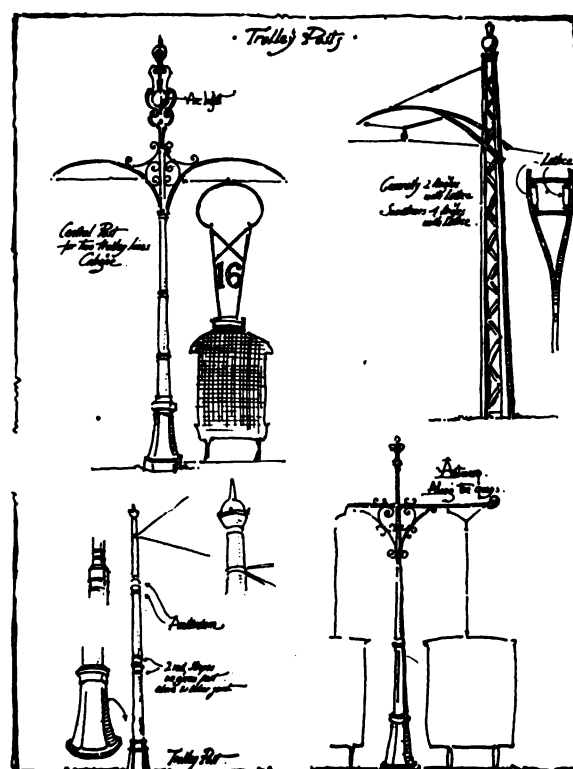
No. 1.



No. 2.



No. 3



No. 4.

PLATE 4.

No. 1. Electric Light Poles.
No. 2. Lamp-posts.
Nos. 3 and 4. Trolley Posts.



No. 1.



No. 2.



No. 3.

PLATE 5.

No. 1. Trolley and Lamp-post combined. Hamburg.
Nos. 2 and 3. Telegraph Poles. Amsterdam.



PLATE 6. Walk under the Elevated Railway in Berlin. Called "the Umbrella of Berlin."



No. 1.



No. 2.



No. 3.

PLATE 7.

- No. 1. Entrance at Amsterdam.
- No. 2. Promenade under the Elevated Road in Berlin.
- No. 3. View of the Elevated Road in Berlin.



PLATE 8. Details of the Elevated Railroad Structure in Berlin. From "Die Architektur der Elektrischen Hochbahn in Berlin."



PLATE 9. Elevated Railway crossing a bridge at Berlin.

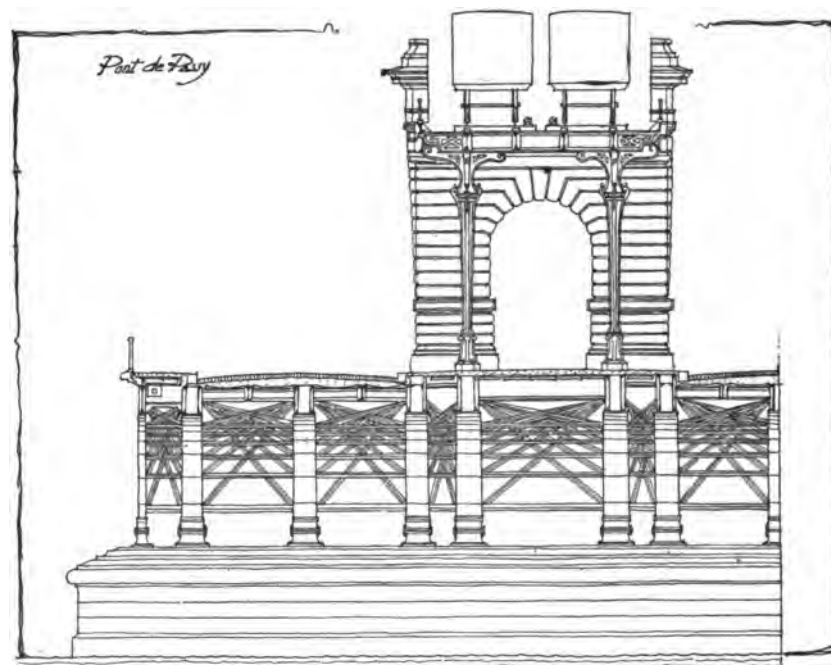
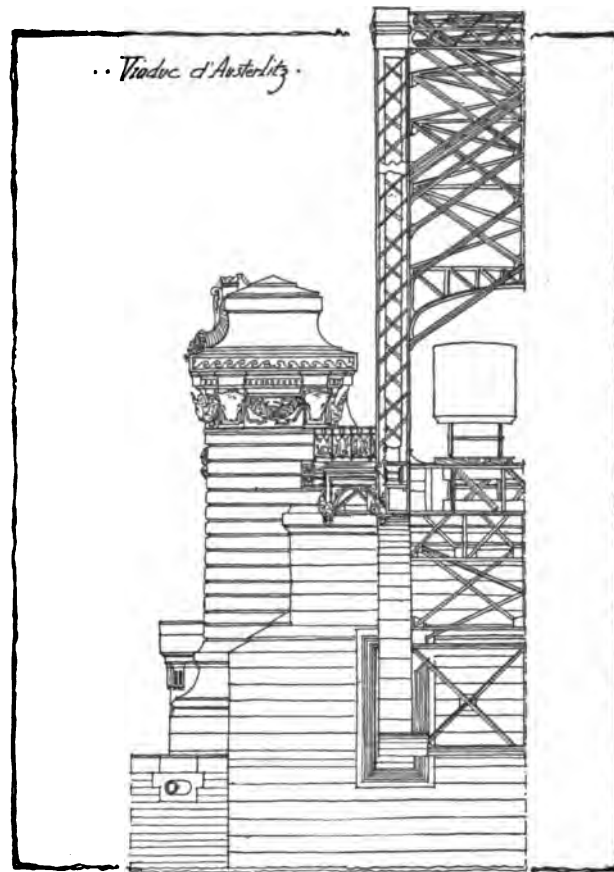


PLATE 10. Details of the two Bridges by which the Elevated Railway in Paris crosses the Seine.

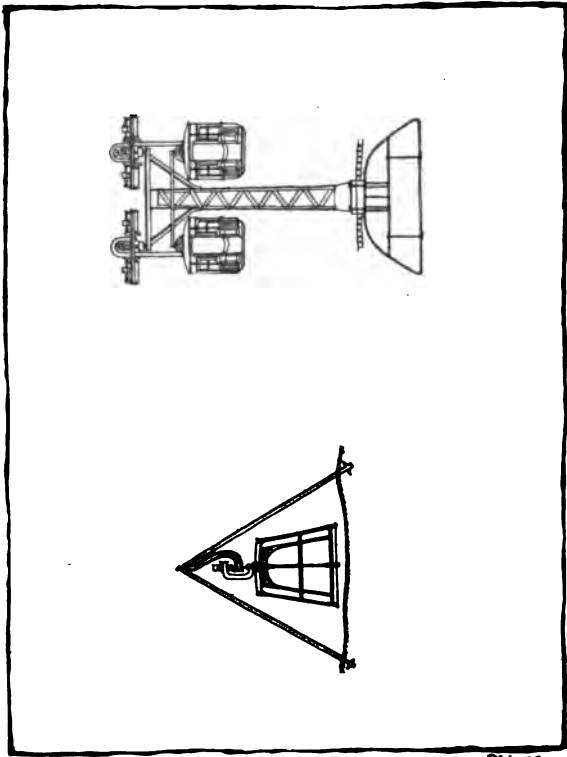


Plate 29.

... Examples of *Overhead Single Rail* Railway.

No. 1.

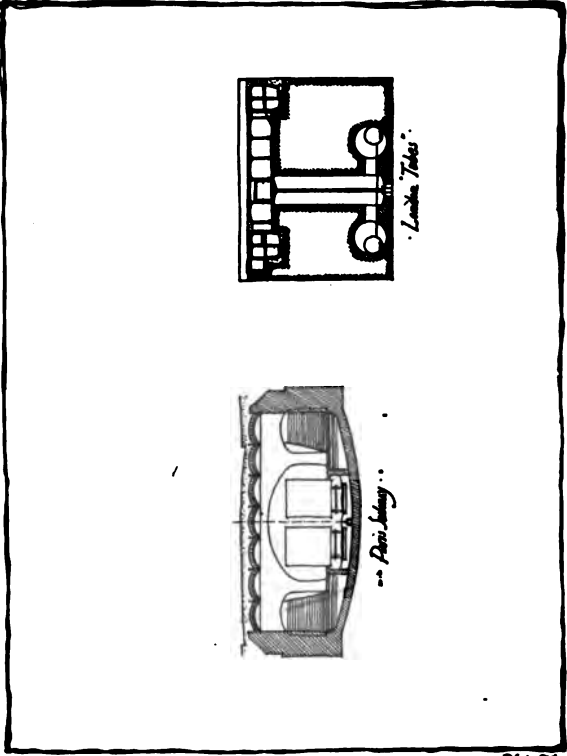
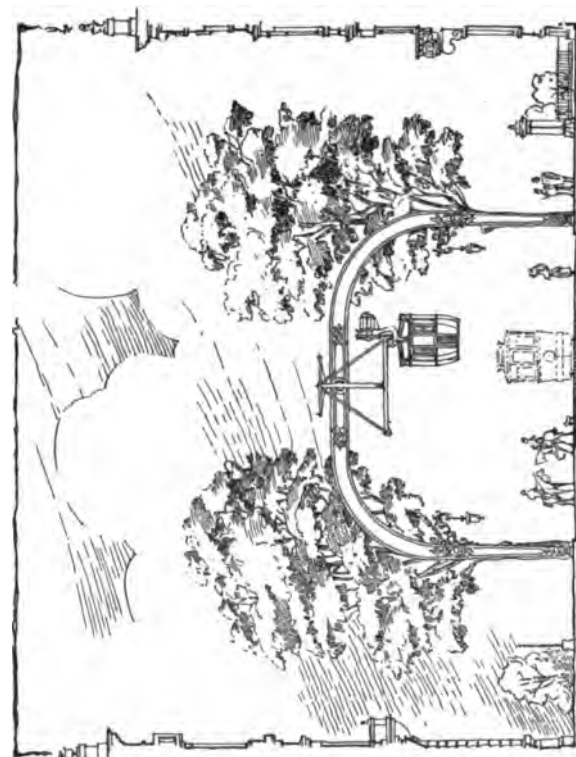
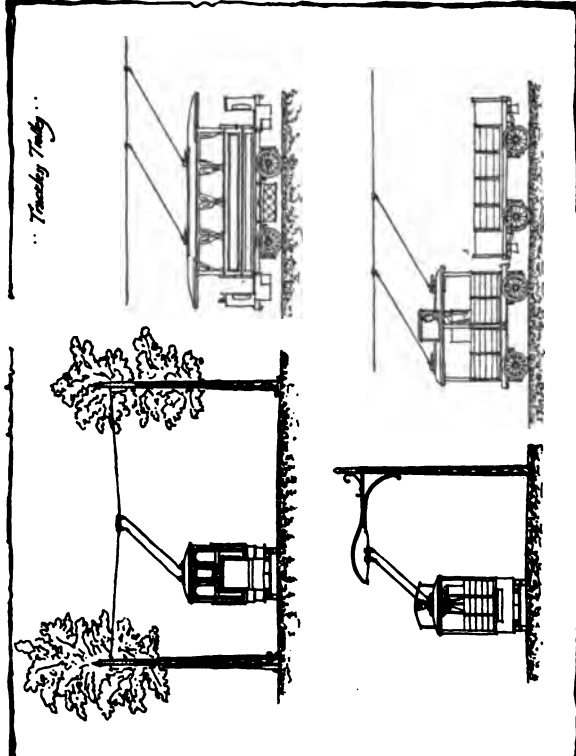


Plate 31.

No. 2.



No. 3.



No. 4.

PLATE 11.

- Nos. 1 and 3. Single Rail Suspended Railways.
- No. 2. Sections of the Paris Subway and the London Tubes.
- No. 4. Trackless Trolley Roads.

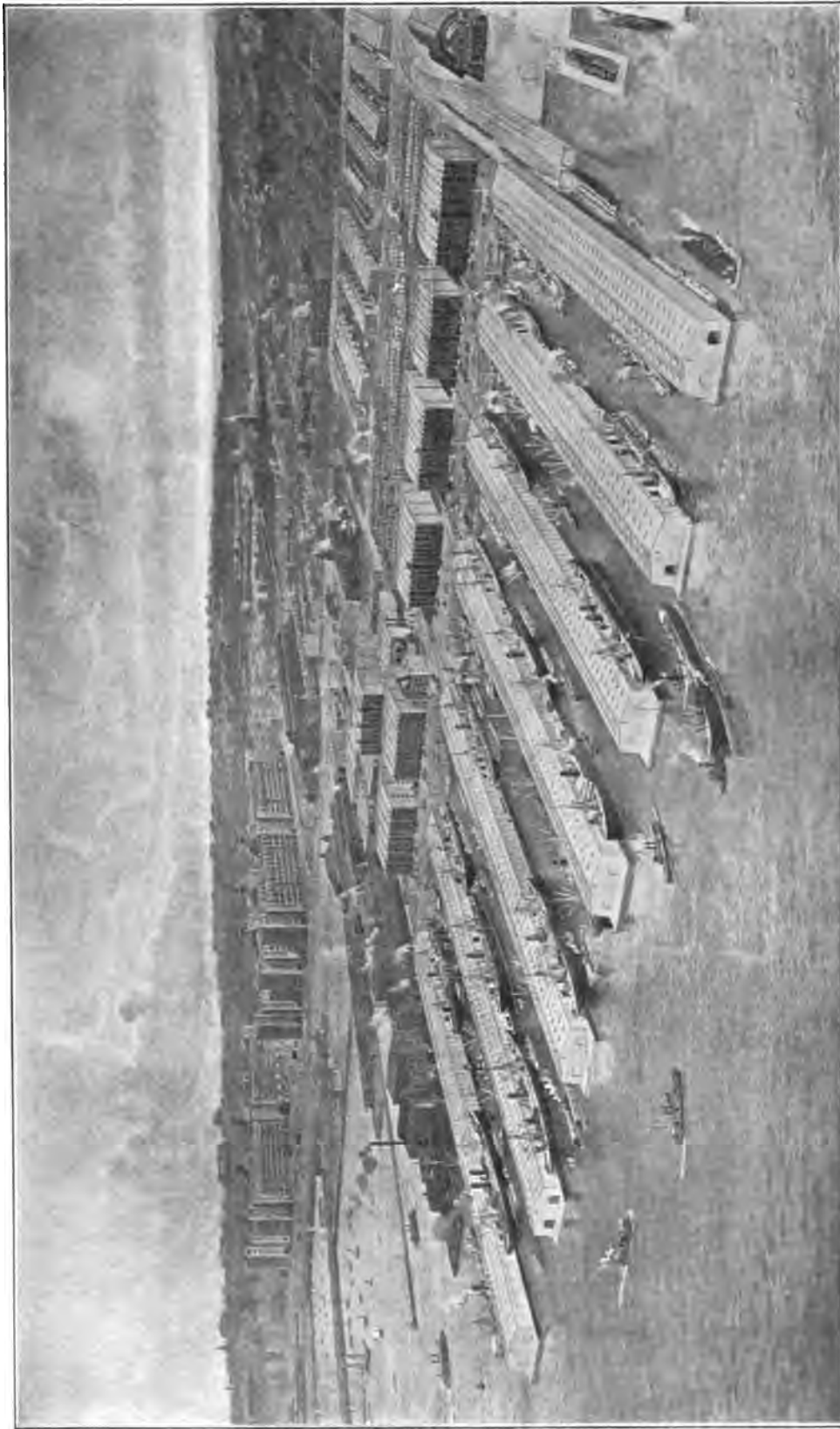


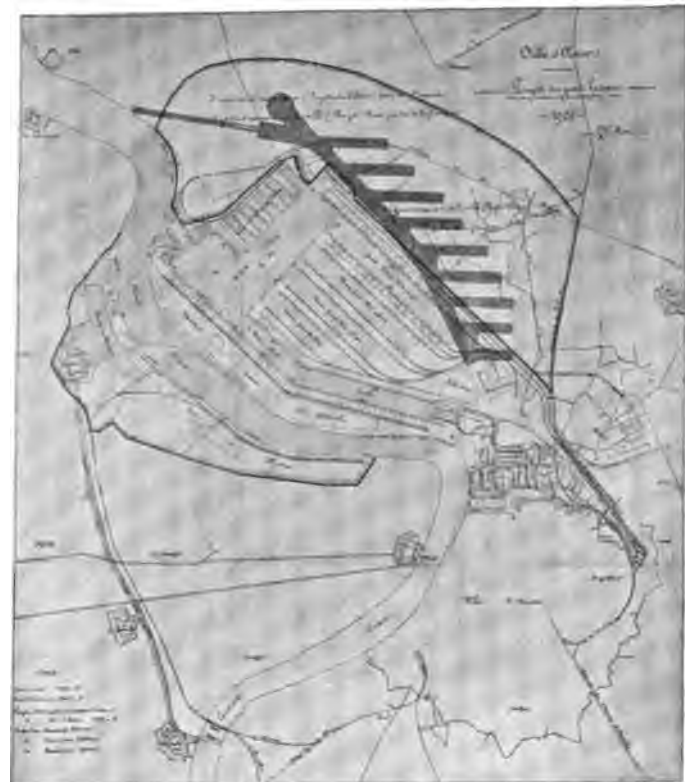
PLATE 12. Bush Terminal Company's Piers, Warehouses, Distributing Railway, and Factories, on the South Brooklyn Water Front.



No. 1.



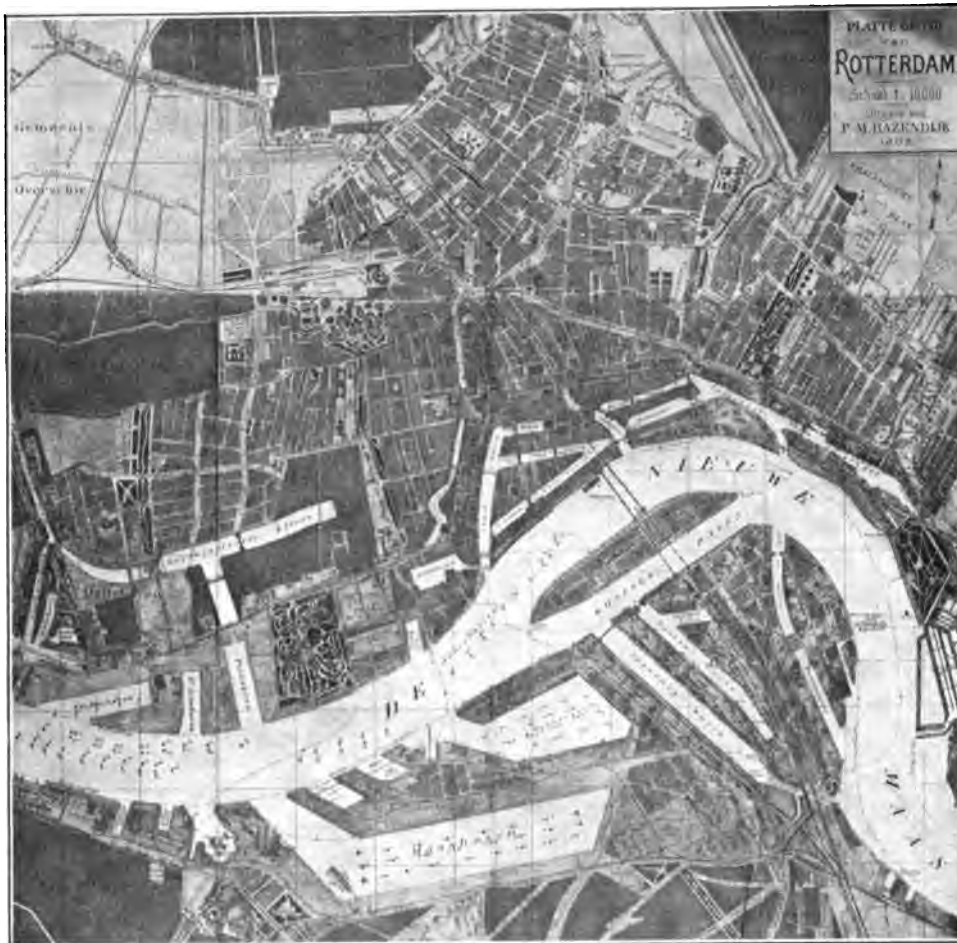
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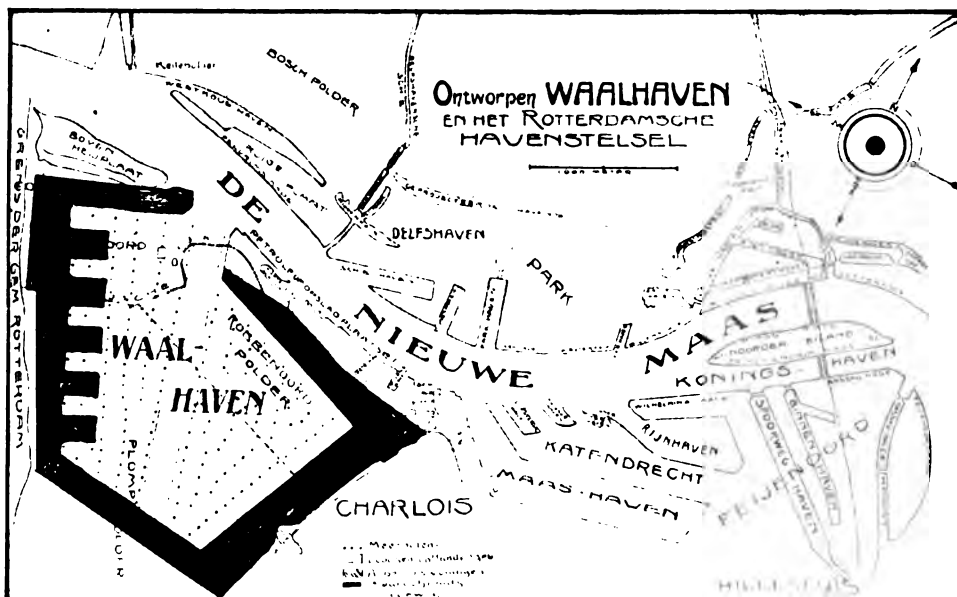
No. 3.

PLATE 13.

- No. 1. Plan of the Existing Docks at Antwerp. The river front of the city (not shown on this plan) is also a continuous quay.
- No. 2. Plan showing the "Coupure" and the Proposed New Docks, by the side of which the Existing Docks are seen as very small, although really very large.
- No. 3. Plan showing the "Coupure" and its Docks in grey, and also an alternative scheme for enlarging the Docks without changing the course of the river.



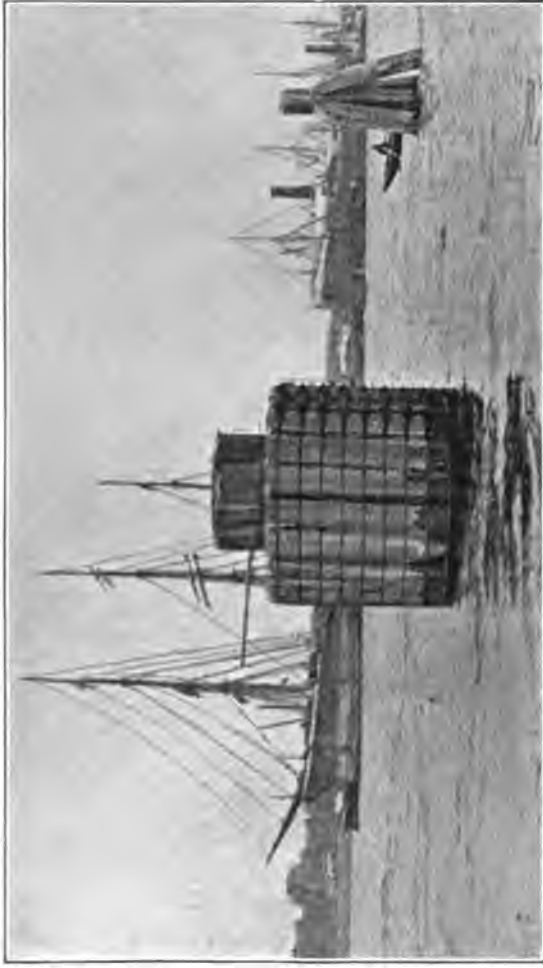
No. 1.



No. 2.

PLATE 14.

- No. 1. Plan of the Docks at Rotterdam.
 No. 2. Plan showing the Proposed New Dock and its size in relation to the existing docks.



No. 1.



No. 2.

PLATE 15.

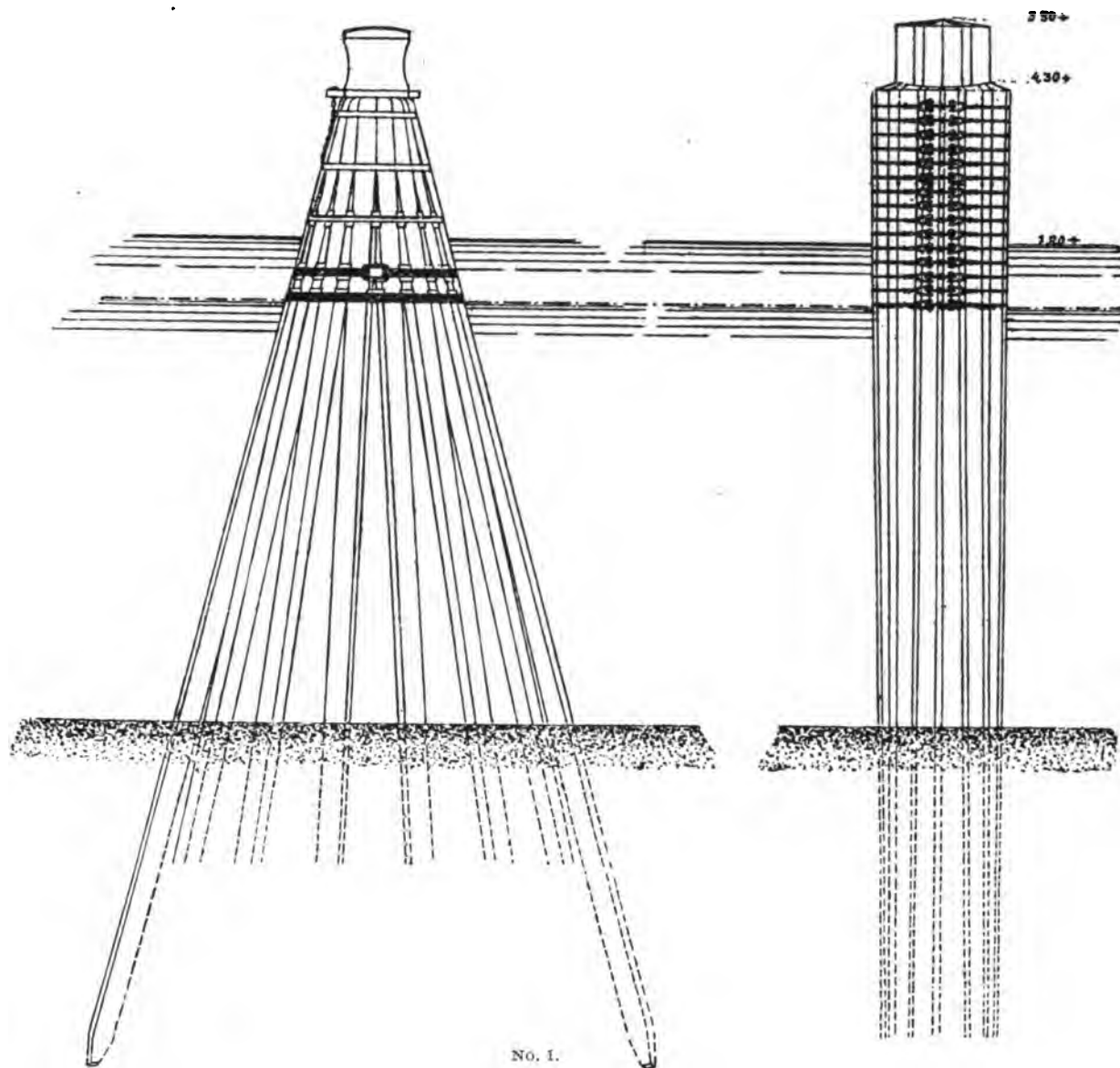
No. 1. View of a Pile Mooring Pier in the Maas at Rotterdam.

No. 2. Plan of Amsterdam and the North Sea Canal with its outlet at Ymuiden on the North Sea.

1

2

3



No. 2.

PLATE 16.

No. 1. Pile Piers for Mooring Ships.

No. 2. Rotterdam Harbor. Ships moored in the stream discharging cargo into lighters and receiving coal from barges.

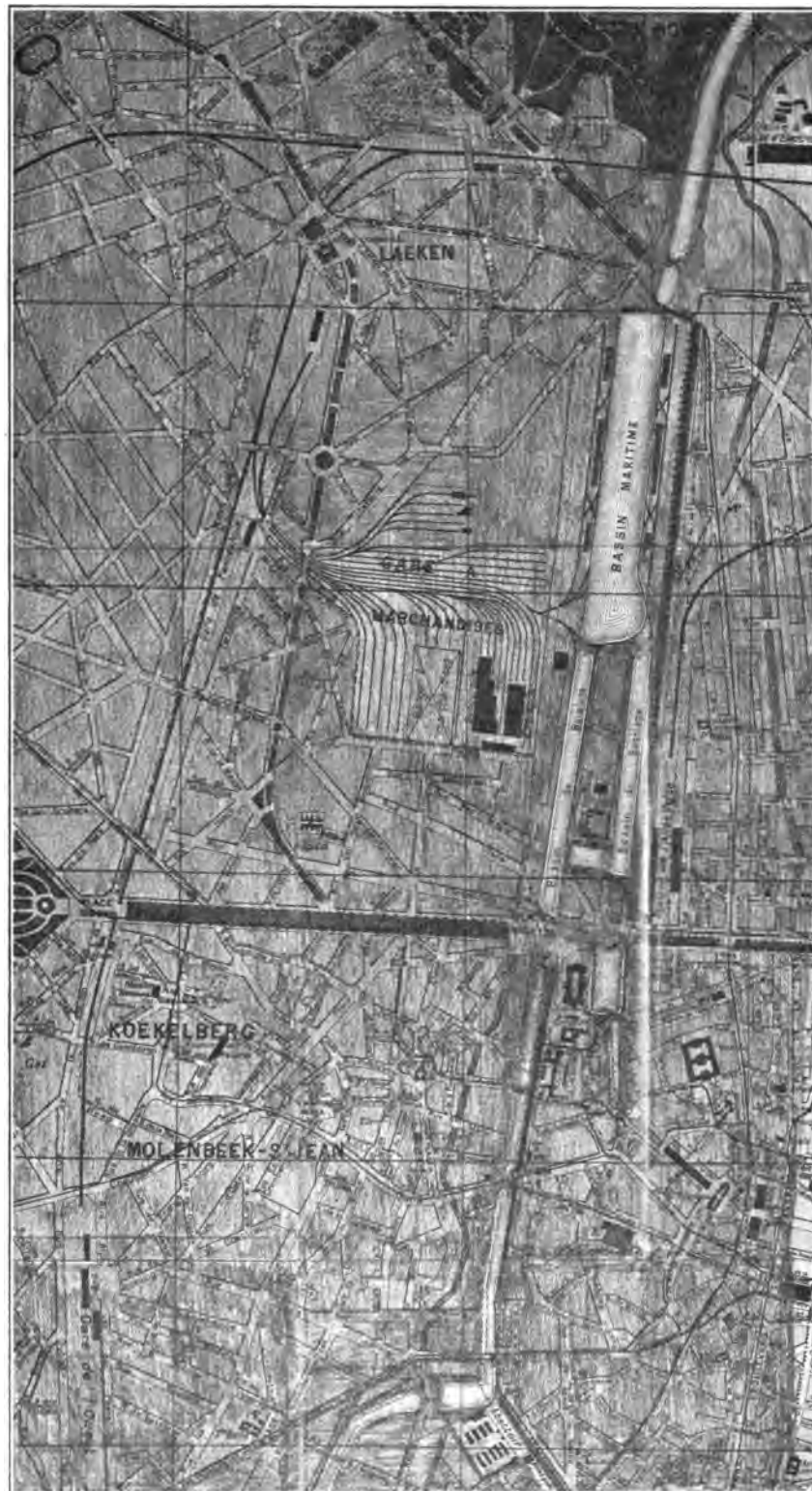


PLATE 17. Plan of Brussels, showing the Marine Docks and Freight Terminals of a city sixty miles from the ocean.

Bureau für Strom- und Hafnbau, Hamburg 1905
1/1 Hamburg

Querschnitt durch die Quaianlagen auf dem großen Oranbrück



Querschnitt durch den Baakenhafen



Querschnitt durch den Segelschiffhafen



Querschnitt durch die Hafenanlagen auf Kuhwärder (Nördlicher Teil)



Querschnitt durch die Hafenanlagen auf Kuhwärder (Südlicher Teil)



PLATE 18. Hamburg. Sections through some of the Docks.



No. 1



No. 2.



No. 3.



No. 4.

PLATE 19. Hamburg. Nos. 1 and 2, Canal for Lighters between the Storage Warehouses. Nos. 3 and 4, Custom Station and Pile Barricade enclosing the Free Port.

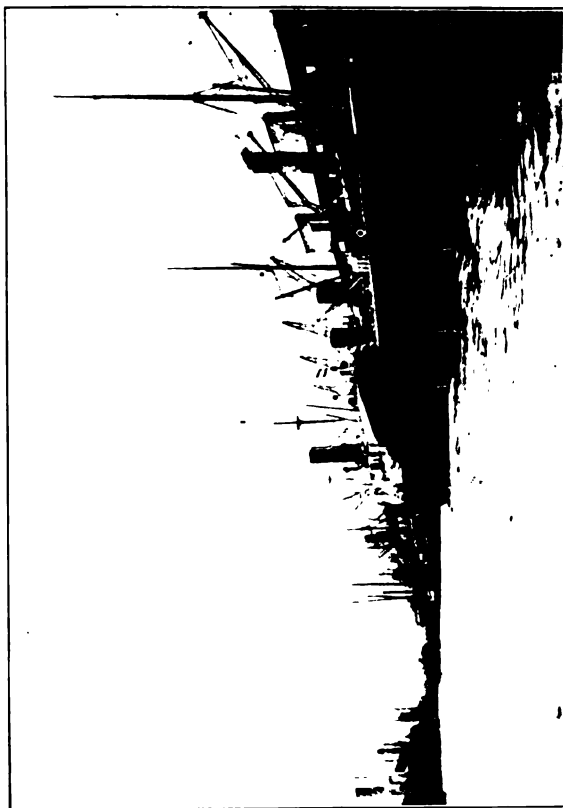
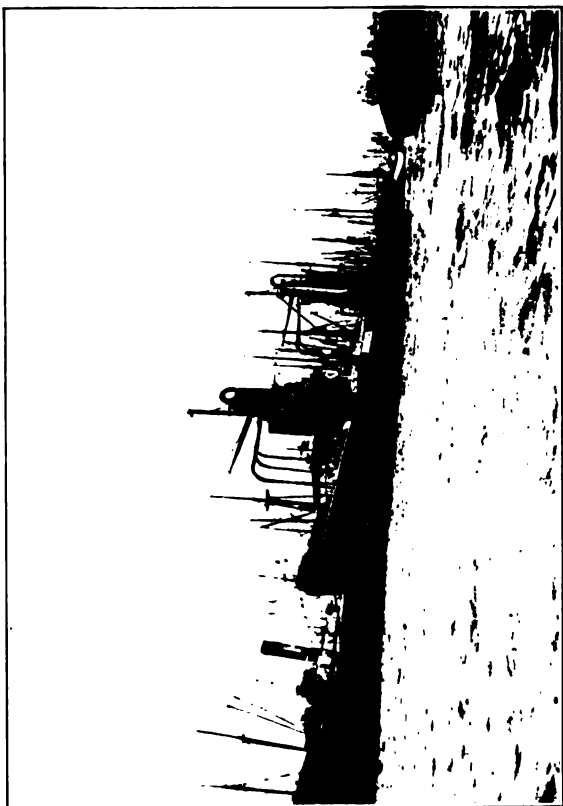


PLATE 20. Views in the Docks at Hamburg.



PLATE 21. Hamburg. Electric and Hydraulic Travelling Cranes on the Docks.

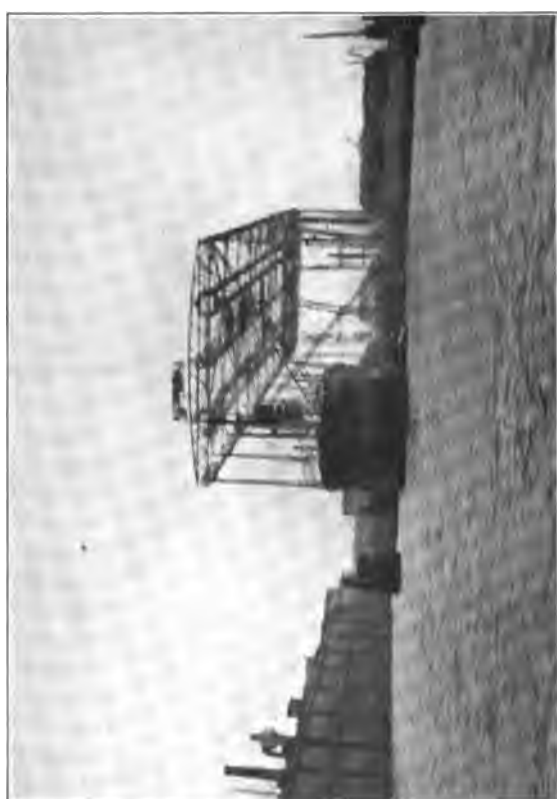


PLATE 22. Hamburg. Ship-building Plant; Dry Dock; Great Crane.



PLATE 23. Plan of the Docks at Hamburg.

1



PLATE 24. Hamburg. Views of the Alster Basins and of the Road and Railway Bridge between the Upper and Lower Basins.

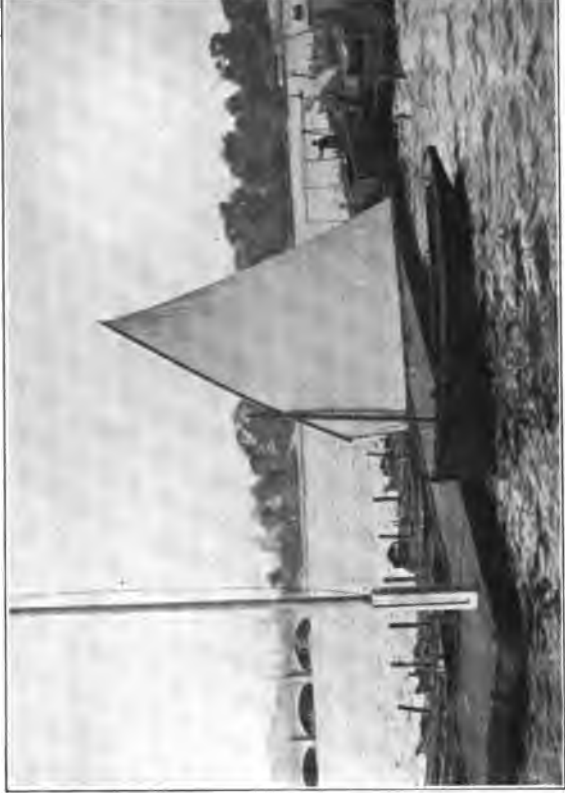


PLATE 25. Views on the Borders of the Alster Basins.

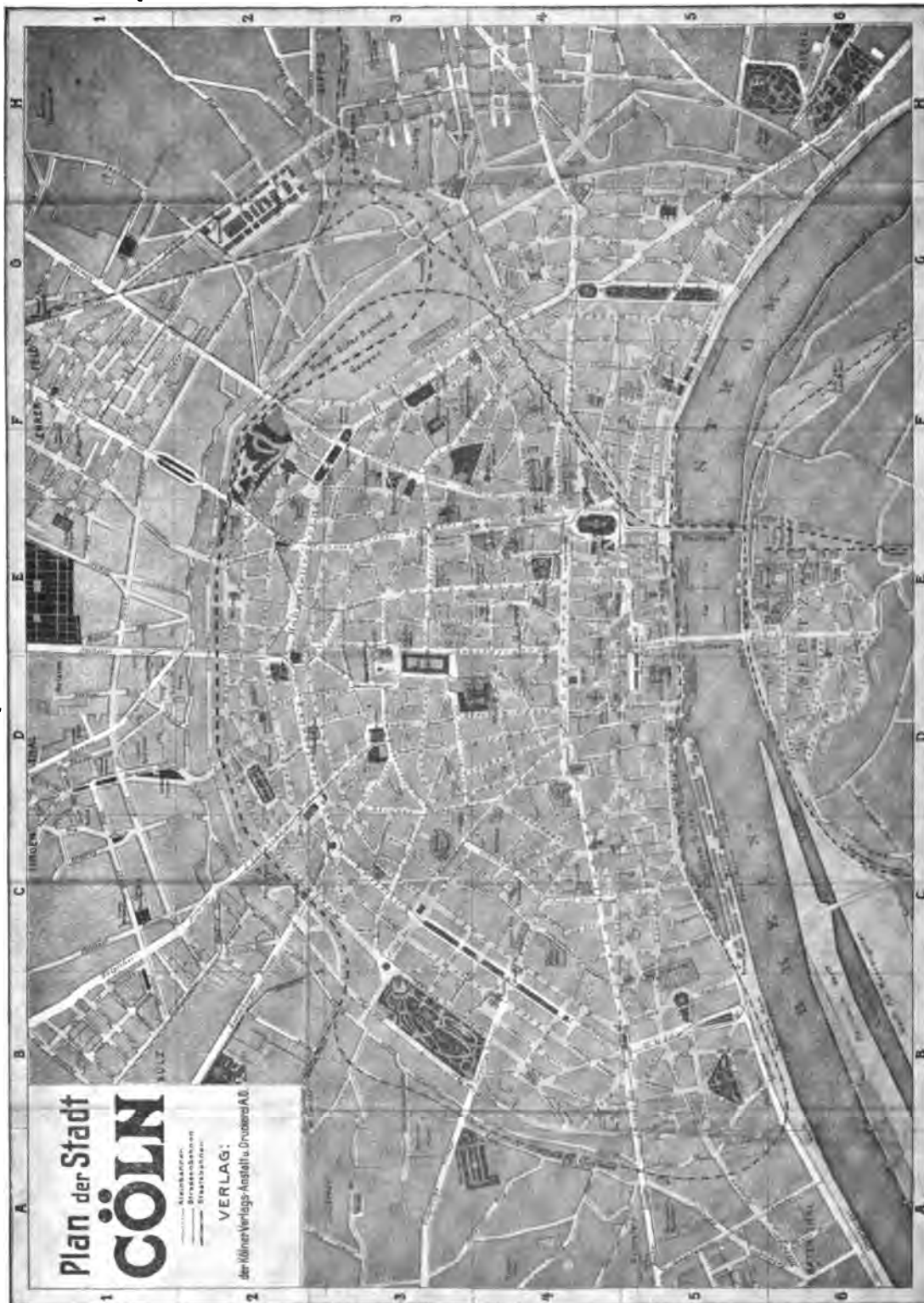


PLATE 26. Plan of Cologne, showing the Docks and Railway Connections. Also the Boulevard on the site of the Old Walls and the New City outside of the same.

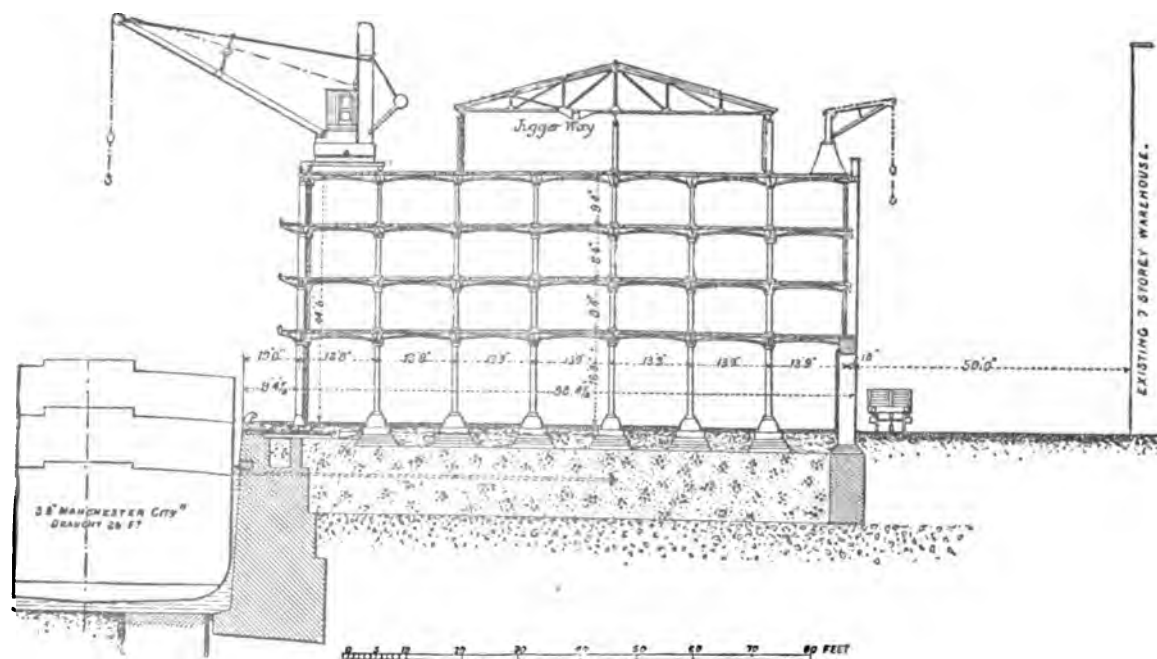
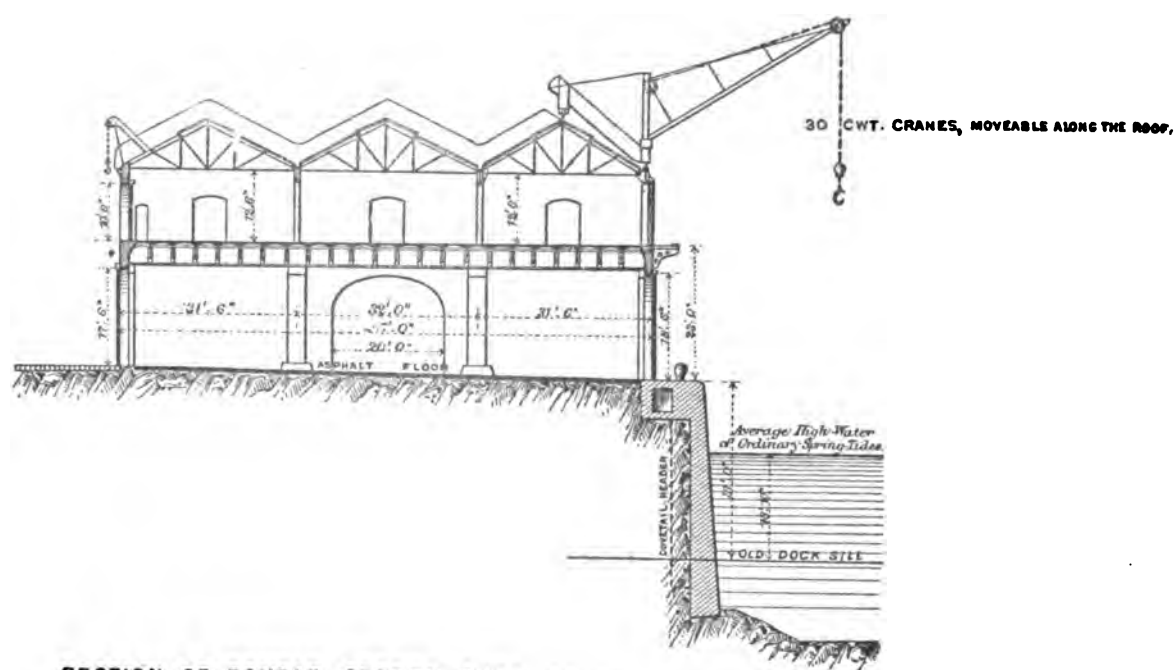
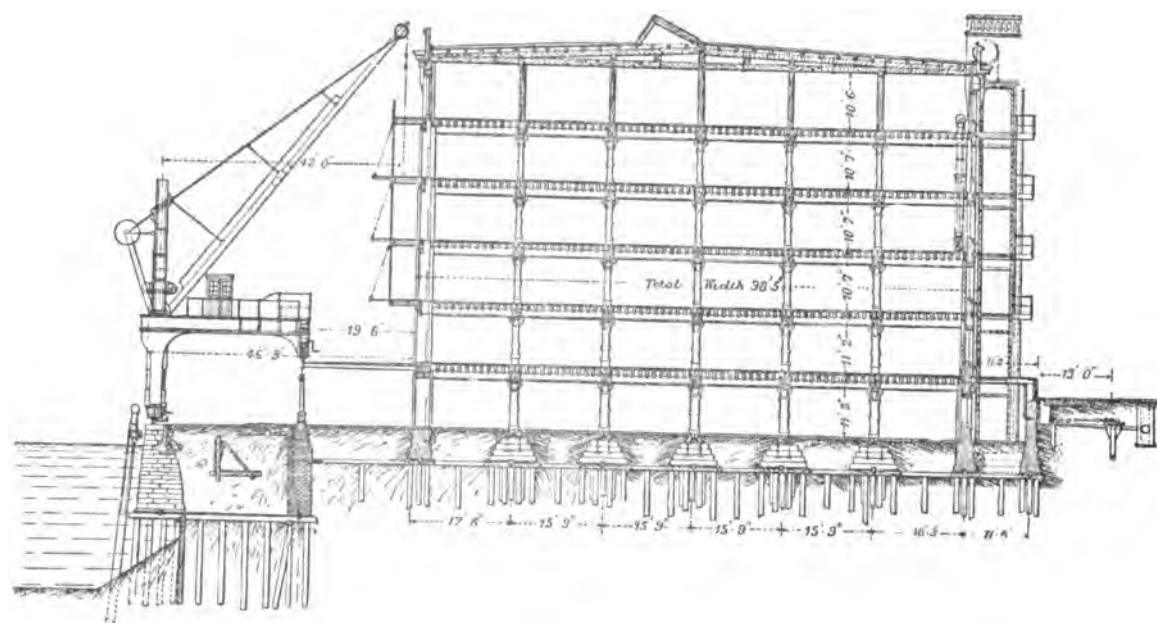
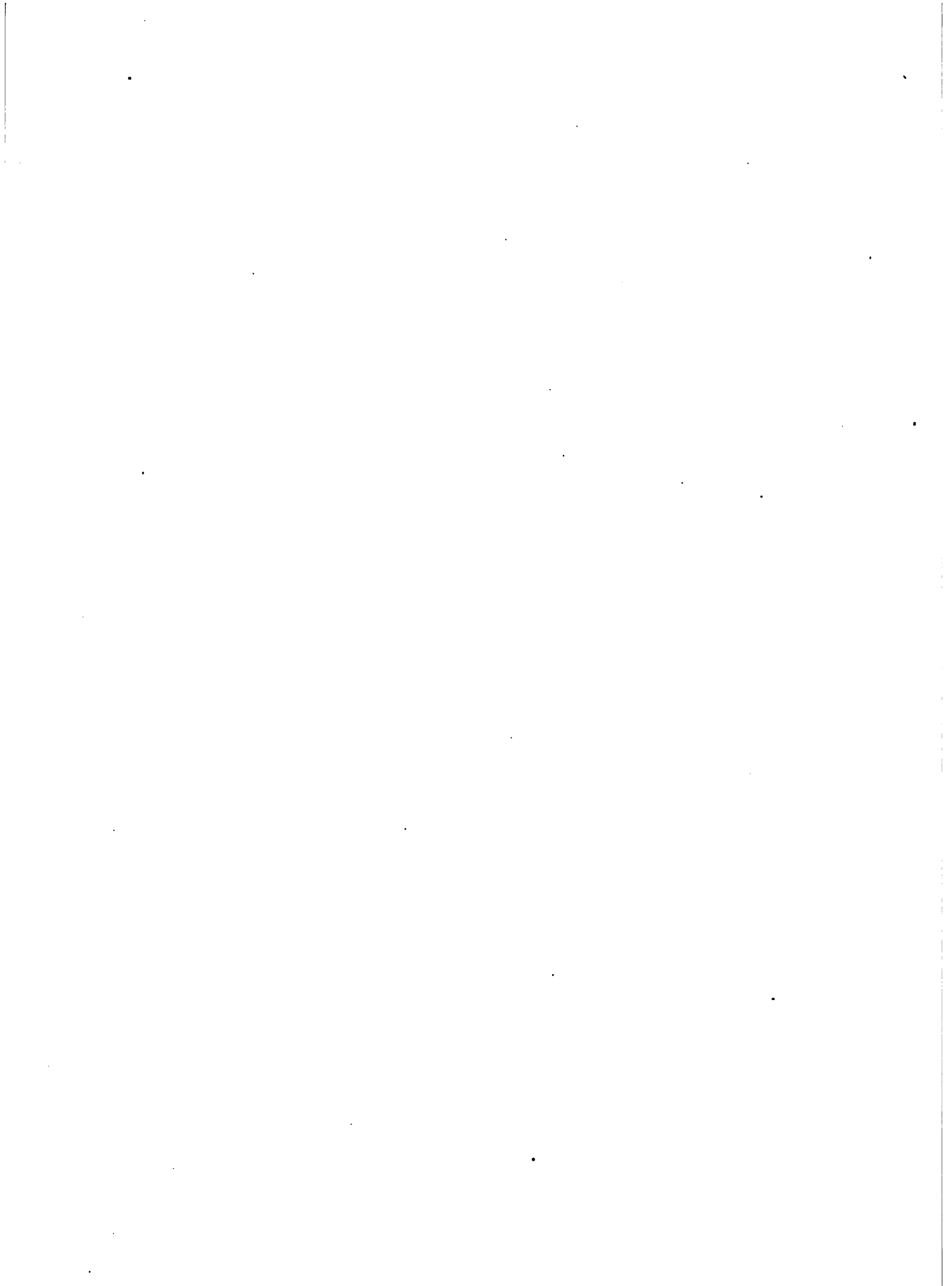


PLATE 28. Typical Warehouses and Cranes at Liverpool and Manchester. From Cunningham's "Dock Engineering."



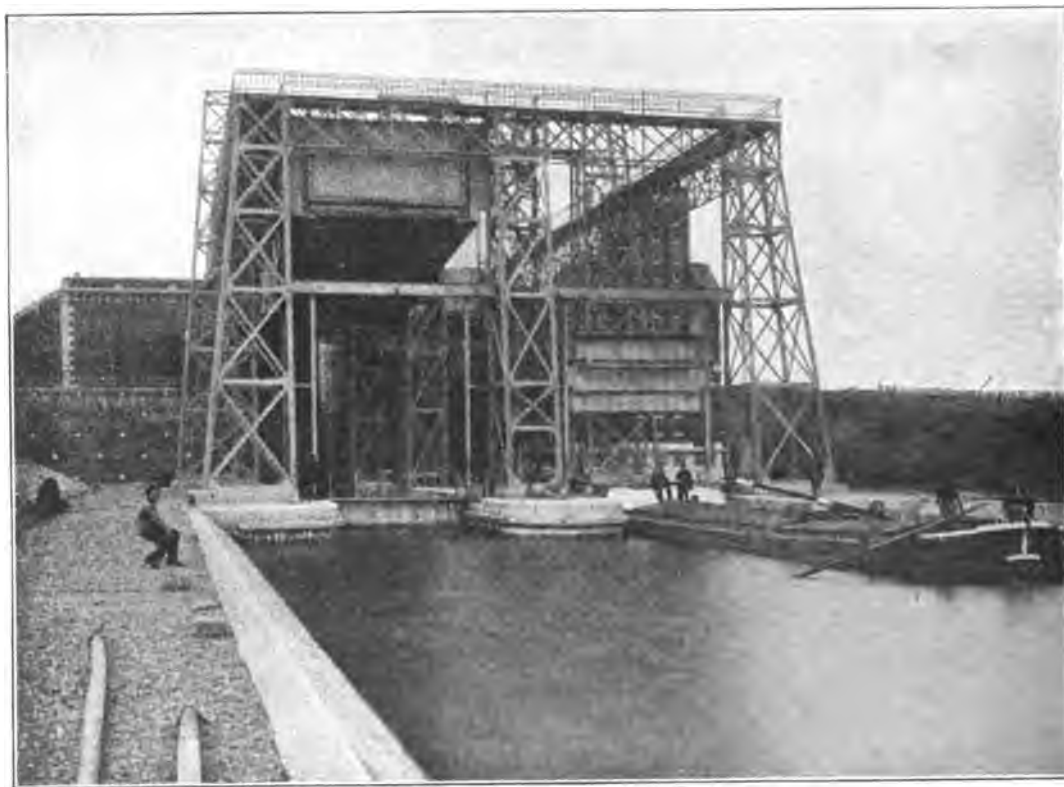
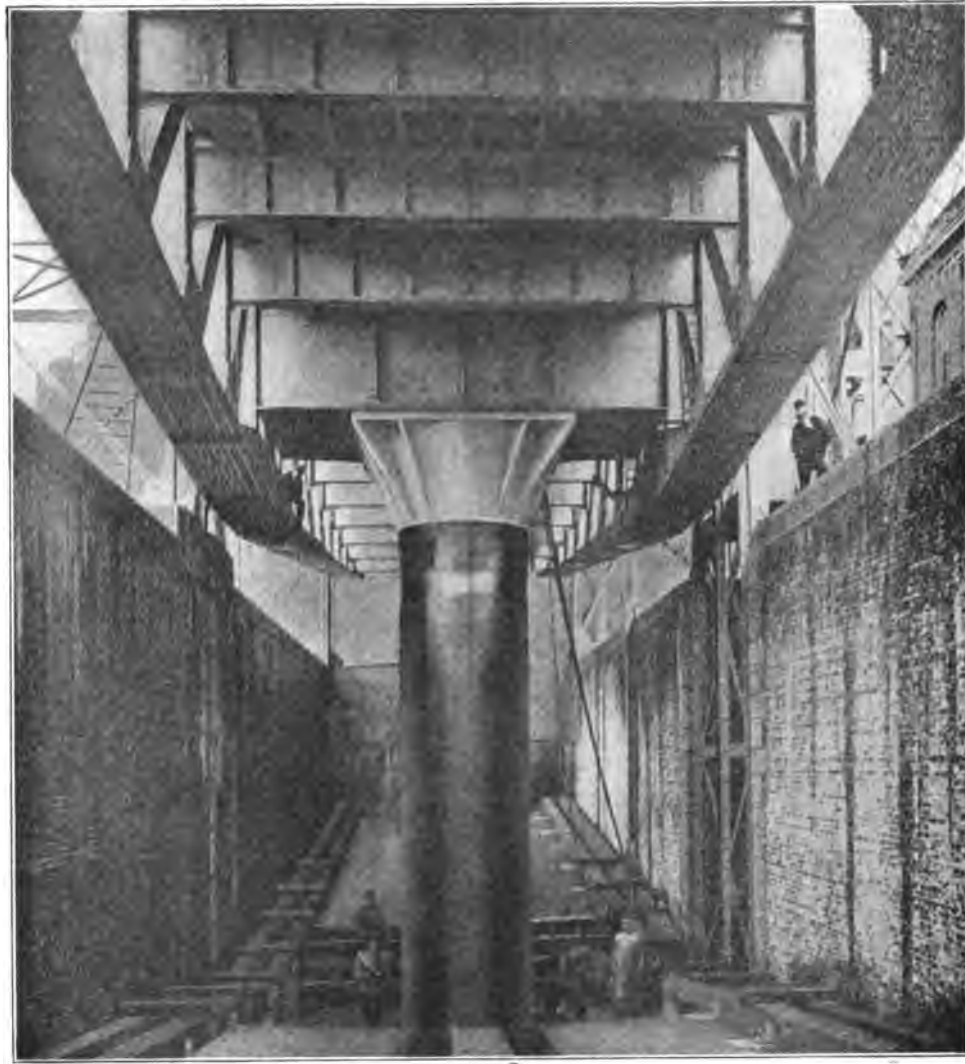
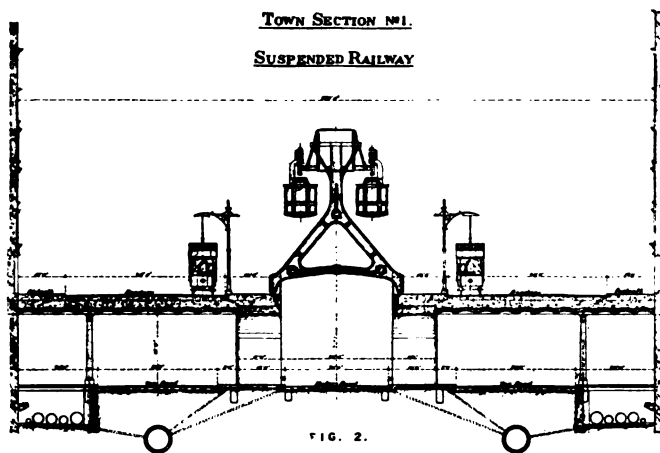


PLATE 29. Elevator for Canal Boats at Houdeng-Goegnies, Belgium. From "La Belgique."

PROPOSED MAIN AVENUES

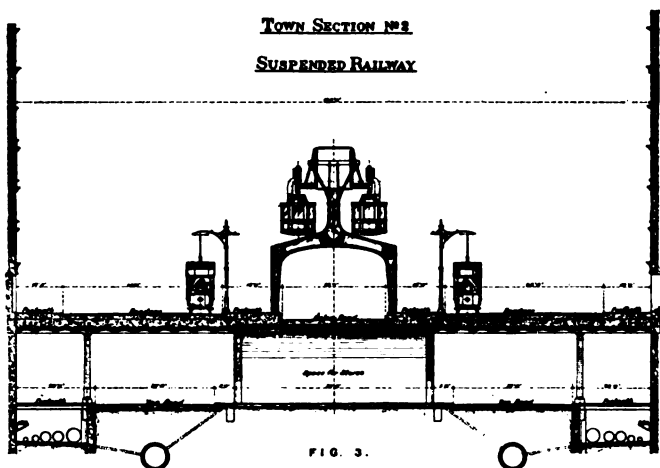
TOWN SECTION NO. 1.

SUSPENDED RAILWAY



TOWN SECTION NO. 2.

SUSPENDED RAILWAY



COUNTRY SECTION

SUSPENDED RAILWAY

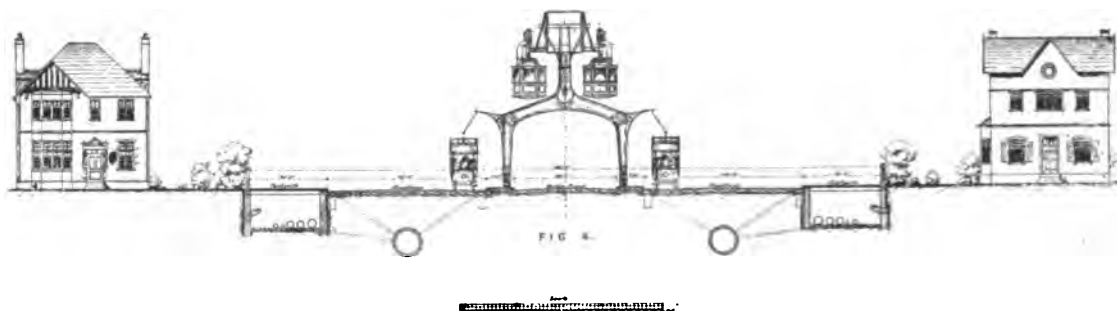


PLATE 30. Design for a Two-storied Street and Elevated Railway. From "The Improvement of London Traffic," by Messrs. Meik and Beer.

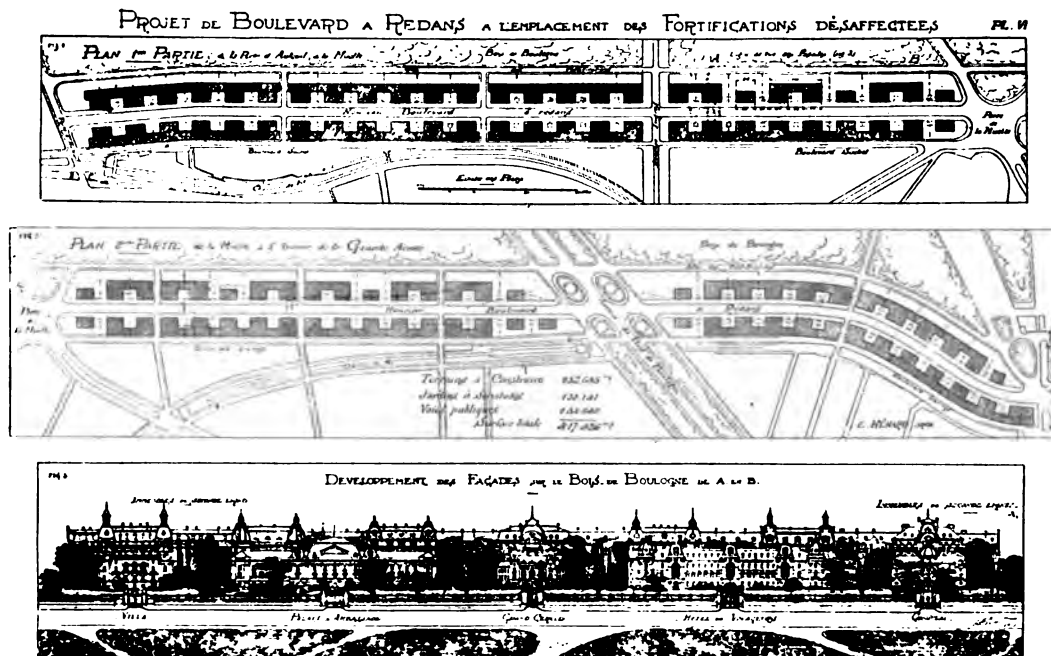
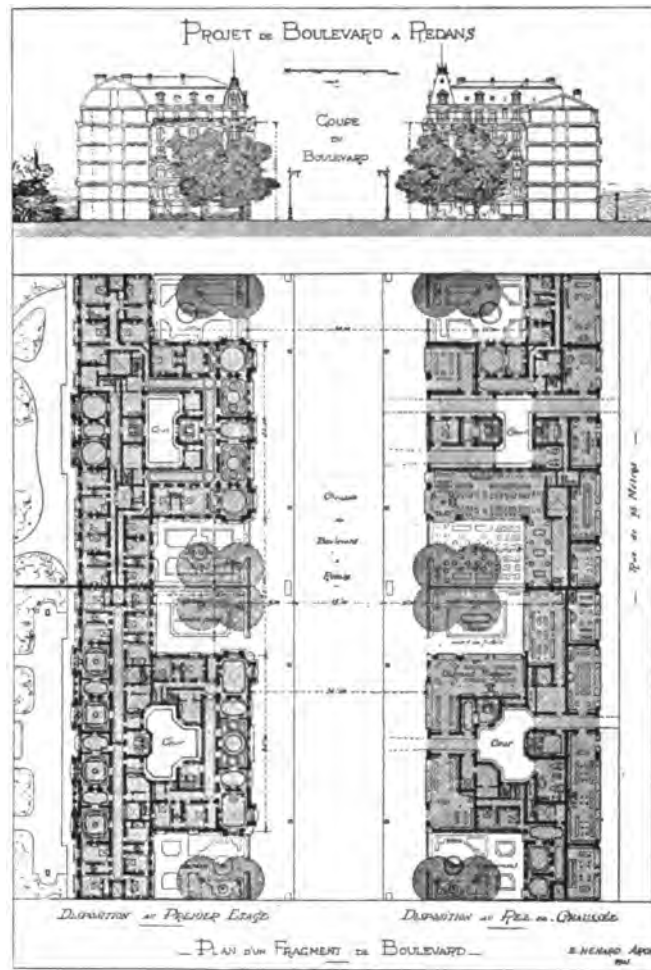


PLATE 31. A New Scheme for a City Street. From "Études sur les Transformations de Paris," by Eug. Hénard.

PLANS COMPARATIFS DES VOIES PRINCIPALES DE CIRCULATION
DANS LES GRANDES CAPITALES

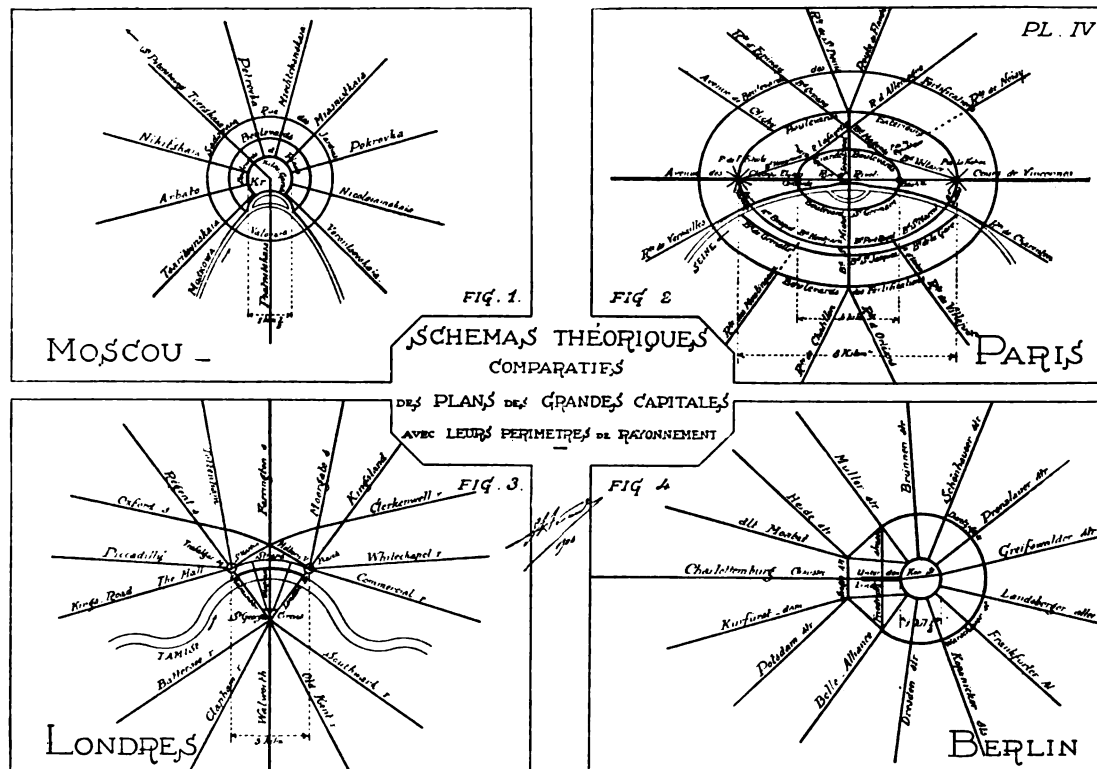
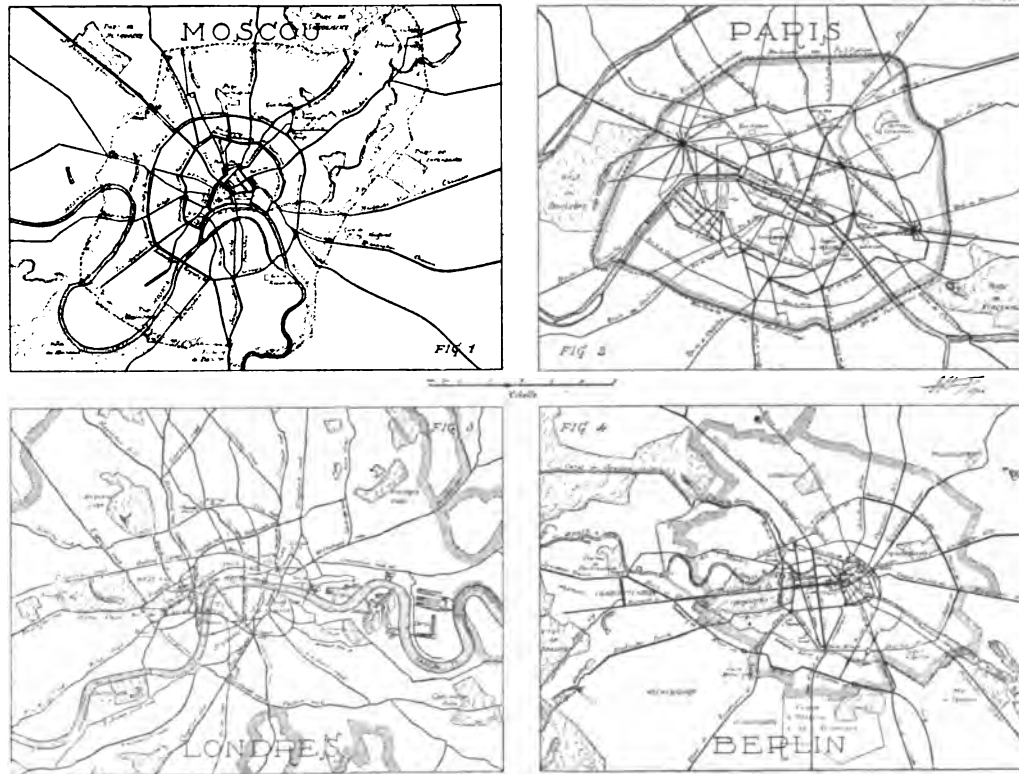
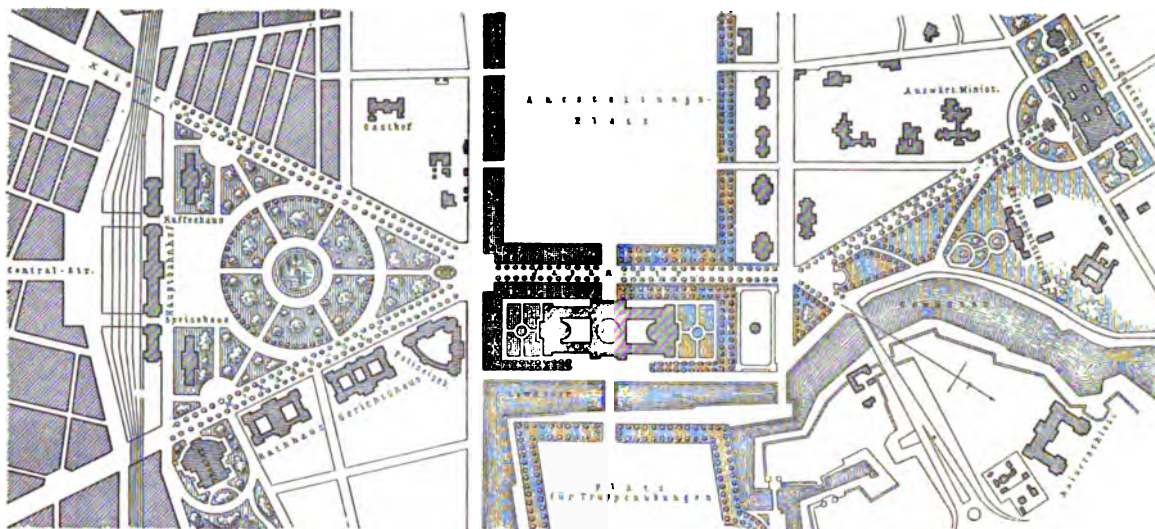


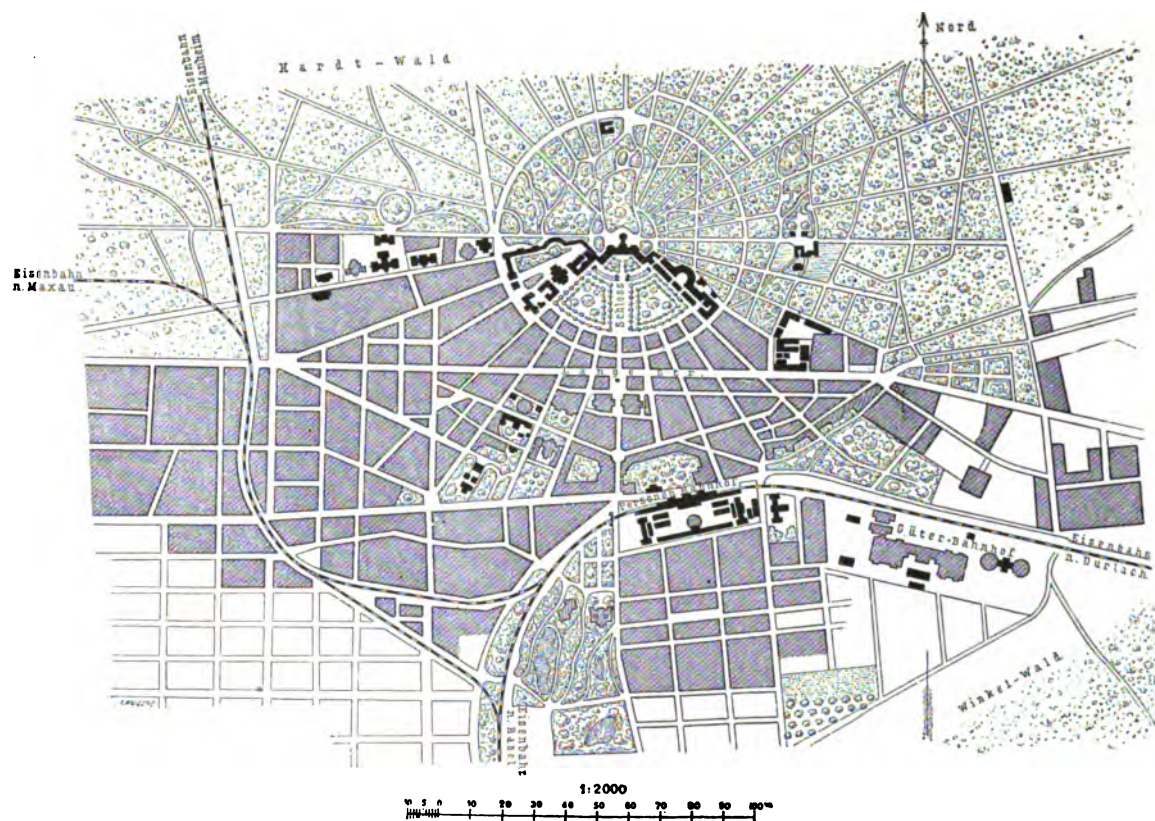
PLATE 32. Comparative Plans of Various Cities and Their Theoretic Schemes. From "Études sur les Transformations de Paris," by Eug. Hénard.



Stadtteil aus Tokio.

1:2000 w. Gr.

No. 1.



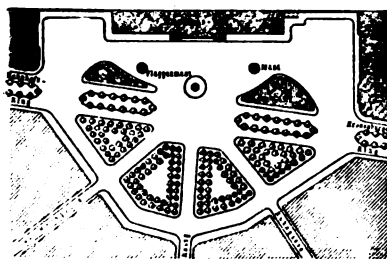
Karlsruhe.

No. 2.

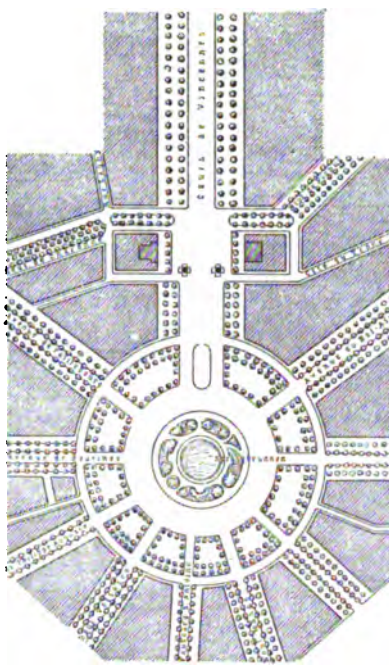
PLATE 33. Two Interesting City Plans.

No. 1. Plan of the City of Tokio. From "Der Stadtbau," by Professor Stübgen.

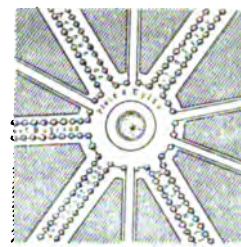
No. 2. Plan of the City of Karlsruhe. From "Der Stadtbau," by Professor Stübgen.



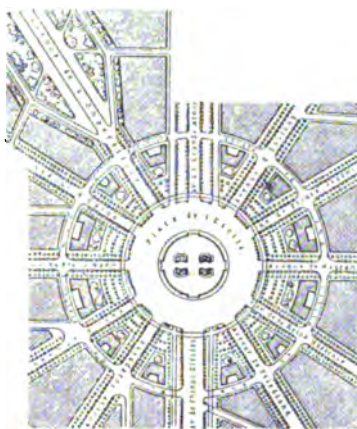
Bahnhofplatz zu Straßburg.



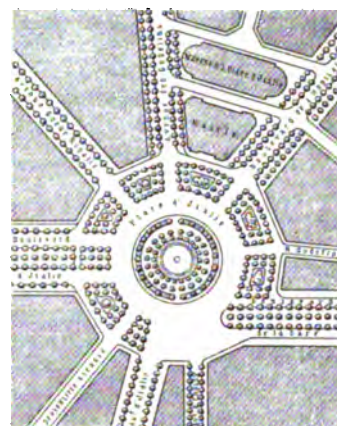
Place des Nations zu Paris.



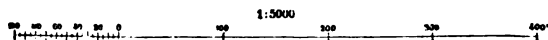
Place d'Eylau zu Paris.



Place de l'Étoile zu Paris.

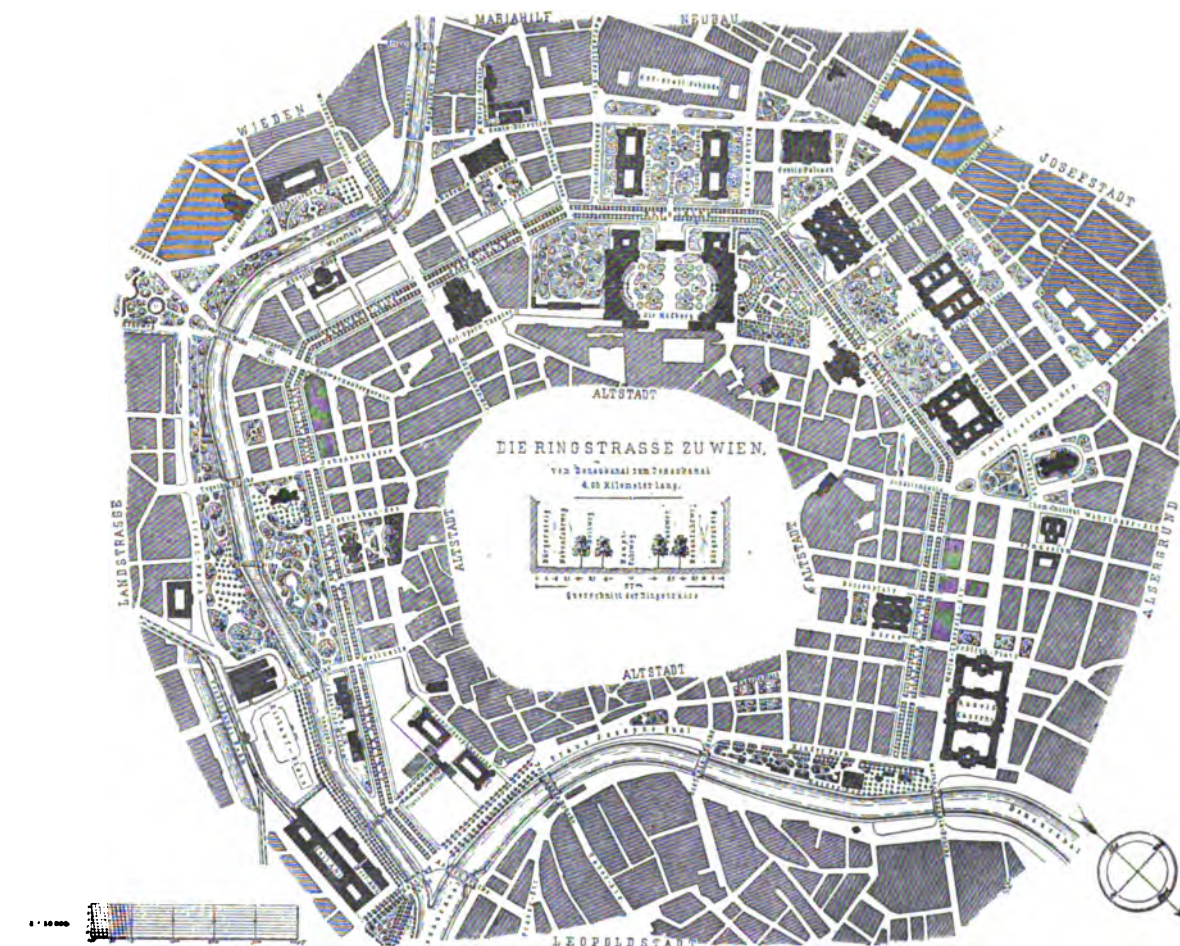


Place d'Italie zu Paris.



Verkehrsplätze.

No. 1.



Handbuch der Architektur IV 9. (a. Aufl.)

No. 2.

PLATE 34. Some Interesting City Plans.

No. 1. Plans of Various Public Places. From "Der Stadtbau," by Professor Stübgen.

No. 2. Plan of the Centre of Vienna. From "Der Stadtbau," by Professor Stübgen.

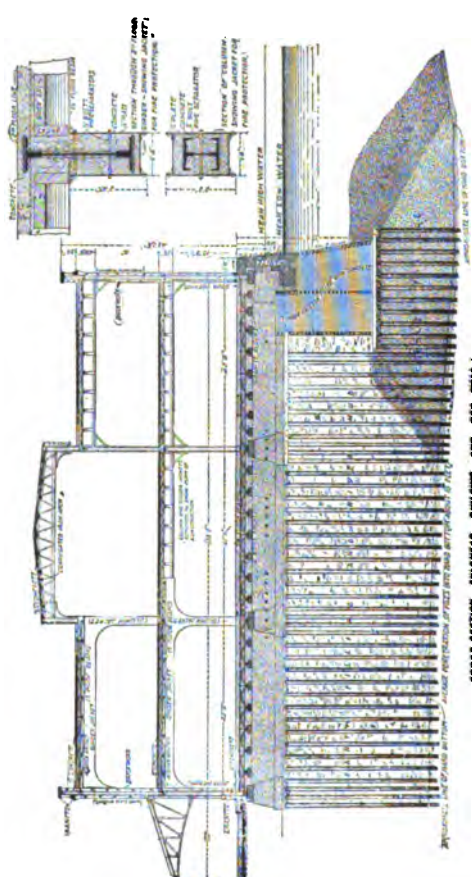
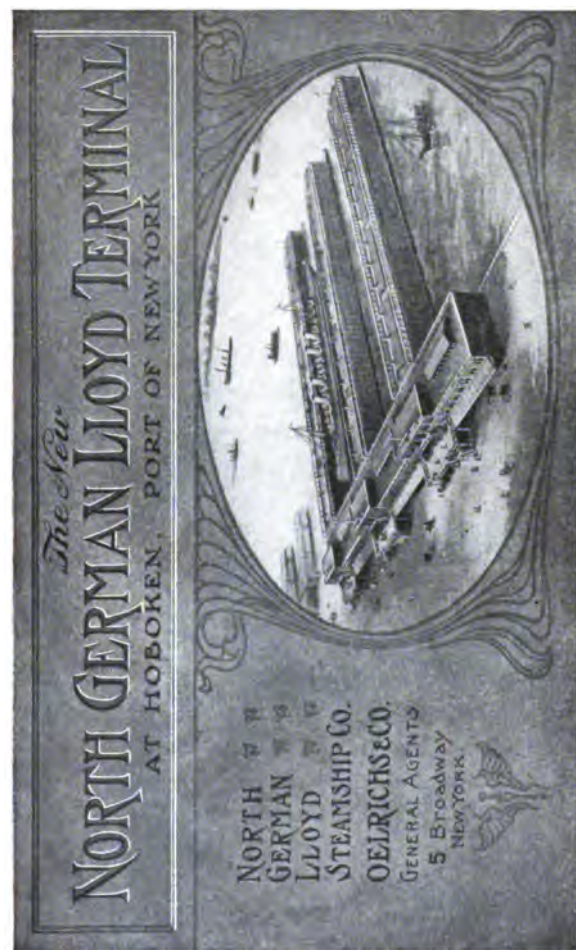
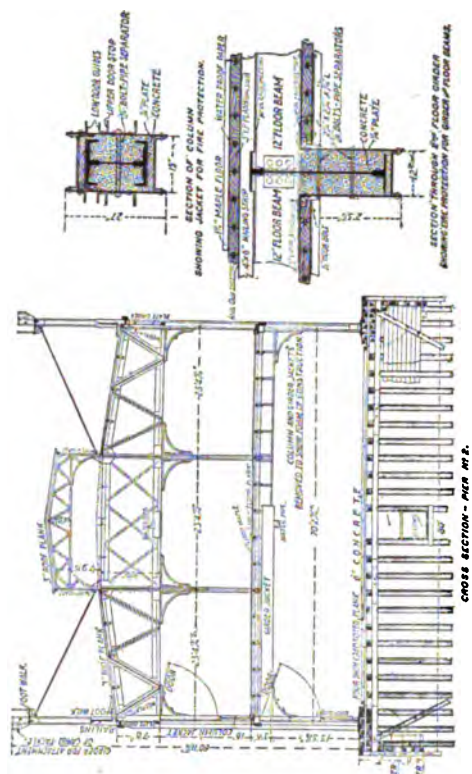
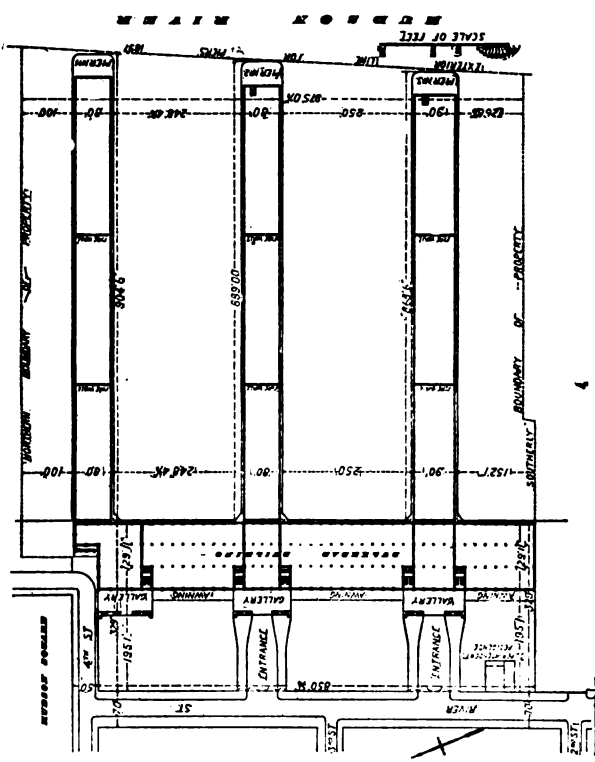
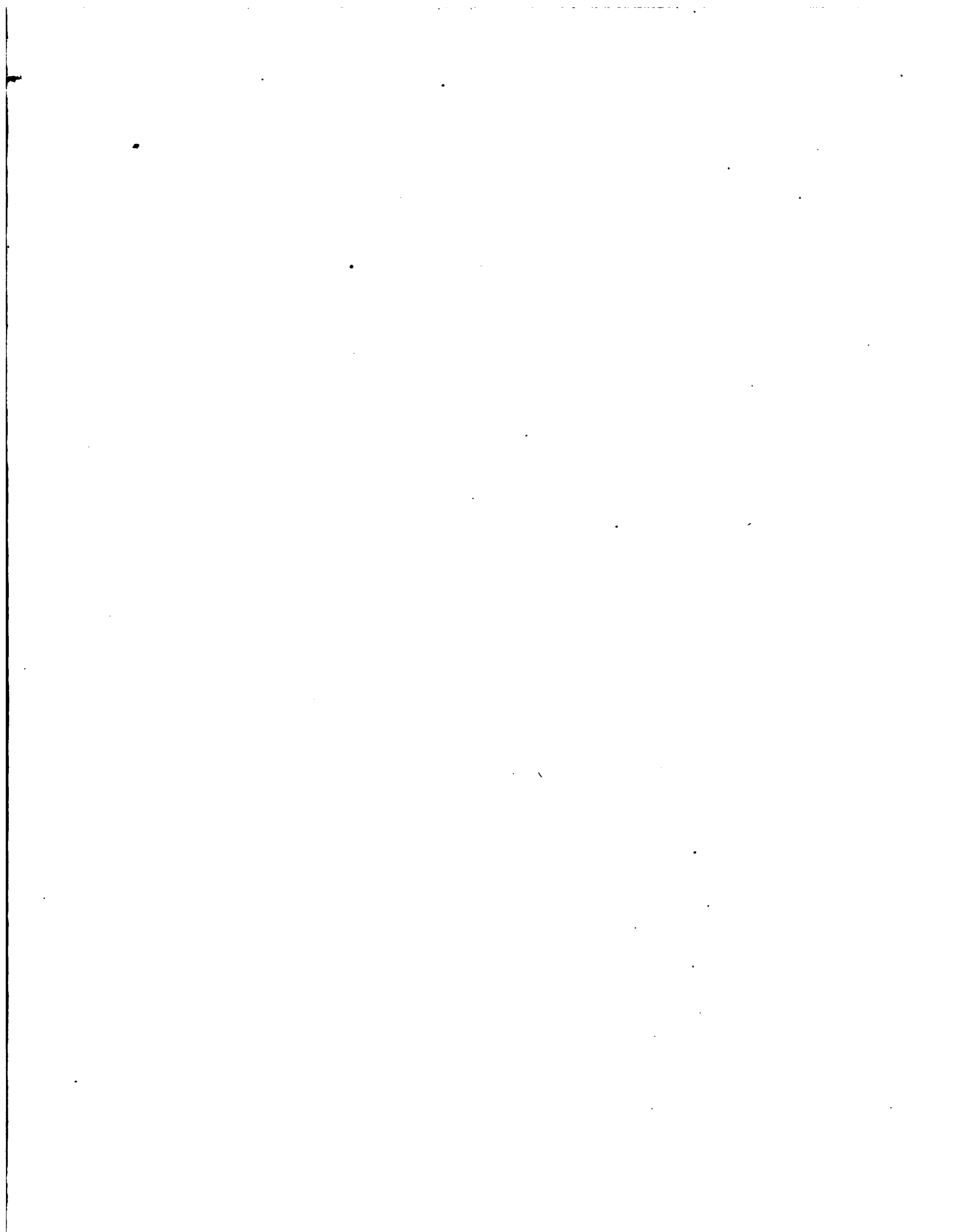


PLATE 35. North German Lloyd Terminal at Hoboken,





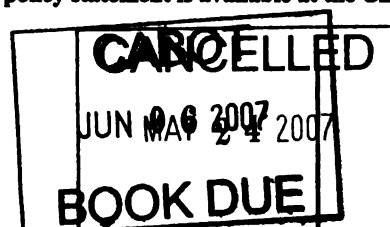


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